



GRADUATE STUDENT HANDBOOK

CHEMICAL ENGINEERING PRACTICE SCHOOL (ChEPS)
www.cheps-kmutt.com

KING MONGKUT'S UNIVERSITY OF TECHNOLOGY THONBURI



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A Message from the Director

Welcome to the ChEPS family!

Our mission is a simple one: to train and produce top chemical engineers to help Thailand's chemical, petrochemical, and petroleum industries compete in the new global economy.

This *Graduate Student Handbook* is meant to provide you with essential information and to answer frequently asked questions that you may have about the ChEPS program. Please take a moment to go through the pages. Of particular interest are the program's policies, important dates, and how the practice stations work.

As ChEPS is an evolving curriculum and the handbook is by no means comprehensive, you are encouraged to periodically visit our website for the latest information and new additions to the handbook. Moreover, everyone at ChEPS is committed to helping you make a smooth transition from your undergraduate study into graduate study. So please feel free to let us know how we can make your learning in the next two years as educational and as enjoyable as possible.

Finally, I wish you good luck with your studies and a pleasant stay at KMUTT. Happy learning!

Sincerely,

A handwritten signature in black ink, reading 'Hong-ming Ku'. The signature is written in a cursive, flowing style.

Asst. Prof. Dr. Hong-ming Ku
Program Director
Chemical Engineering Practice School
KMUTT, Bangkok
July 1, 2020

INTRODUCTION

1. General Information about ChEPS

The Chemical Engineering Practice School (ChEPS) Program at King Mongkut's University of Technology Thonburi (KMUTT) is a two-year international program leading to a Master's Degree in Chemical Engineering Practice. This intensive program is designed to satisfy the long-felt need of high quality bilingual (Thai and English speaking) chemical engineers in the regional chemical industry by training students both rigorously and rapidly. Since the program is international, the medium of instruction and examination is in English. The program, established in 1997, was developed in close collaboration with the Massachusetts Institute of Technology (MIT), which has successfully operated the practice school concept in the USA since 1916.

The ChEPS program receives funds, resources, and support from a variety of organizations. At its inception, ChEPS received financial support from Suksapattana Foundation, a non-profit organization dedicated to the development of education and innovation in learning, and National Science and Technology Development Agency (NSTDA). NSTDA is a public organization whose mission is to advance and sustain the economic development of Thailand through research, technology development, and the promotion of collaboration between the public and the private sectors.

In subsequent years, Petroleum Institute of Thailand (PTIT) and the Energy Policy and Planning Office (EPPO) under the Ministry of Energy provided additional financial support to the ChEPS program. PTIT is an independent non-profit organization supported by the government, academic and private sectors. PTIT's members comprise of petroleum and petrochemical companies, and the institute's main mission is to assist with the development of the two industries in Thailand in areas of human resource development, information service, and policy and regulatory issues. The mission of EPPO is to foster energy conservation and promote public awareness regarding energy savings. Since ChEPS engineers often help the industry save money by minimizing energy consumption, EPPO has a direct interest in funding the program.

Other major contributors of the program also include the Siam Cement Group (SCG), Thai Oil Public Co., Ltd., and PTT Global Chemical Public Co., Ltd. (PTTGC), to name a few. At the same time, many of the program's alumni who received financial support during their studies are contributing 10% of their salaries to help finance ChEPS. In the future, as the ChEPS alumni base grows, the program expects more generous support from its graduates and to eventually emerge as a self-sustaining model of international graduate program.

2. What Is ChEPS All About?

The ChEPS program believes in hands-on approach to engineering education and

training. To expose its students to real-life problems, the program emphasizes developing close ties and partnerships with the chemical industry and the private sector.

Besides technical competency, one of ChEPS' major objectives is to instill "professionalism" into its graduate students. A professional can accept responsibility, can direct the efforts of himself and others to achieve preset goals, and is a self-motivated and result-oriented person. The ChEPS students are treated as fellow professionals, whose contributions through new ideas, concepts, and approaches, are appreciated by the program faculty. In addition, the program is committed to fostering the following attributes in its students:

- Organization and planning
- Leadership and team work
- Engineering judgement
- Engineering economics and management
- Verbal and written communication

CURRICULUM

1. ChEPS Curriculum

There are four regular semesters and one summer session in the ChEPS program. The program curriculum consists of spending one year of graduate coursework on campus, one semester of individual research project also on campus, and one semester in the second year on an industrial site working in teams on technical projects. In the first two semesters, i.e. during the first year, students concentrate on the fundamentals of chemical engineering and engineering management. The remaining two semesters, i.e. the second year, are devoted to chemical engineering practice on-site and thesis research on-campus. Supporting courses such as English, plant design, and process simulation and modeling are taught in the summer session.

Figure 1 depicts a timeline of the ChEPS curriculum.

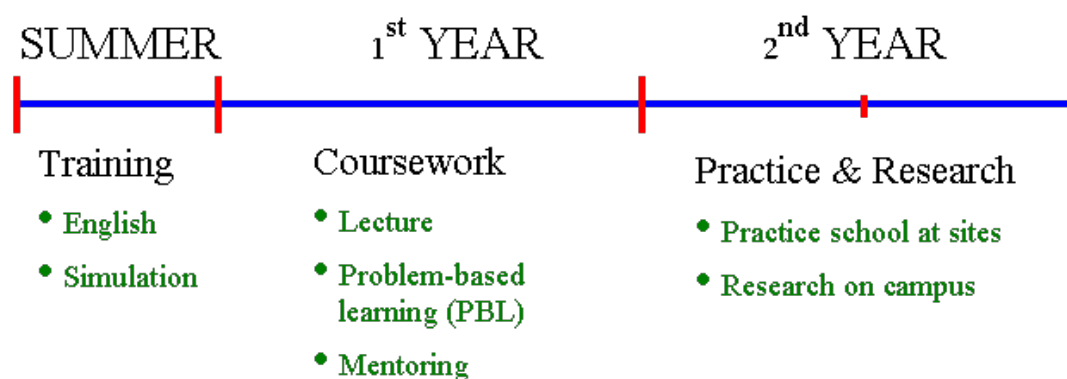


Figure 1: Timeline of ChEPS Curriculum

2. Curriculum Structure and Coursework

2.1 Curriculum Structure

The ChEPS coursework is highly structured and fairly rigid, since the program emphasizes intensive learning and training. Elective courses are virtually non-existent, although the required courses offer a very comprehensive exposure to various fields in chemical engineering. On the other hand, more open-ended problems and training in areas that are of interest to the students are done through problem-based learning (PBL) in the first year, and special research theses and industrial projects in the second year.

The following table shows the various components of the ChEPS curriculum, which confers a degree in Master of Engineering (ME) upon graduation.

<i>Master of Engineering (Chemical Engineering)</i>	
<i>Total program credits</i>	<i>49 credits</i>
<i>Program components</i>	
A. <i>Compulsory Courses</i>	<i>37 credits</i>
B. <i>Elective Courses</i>	<i>0 credits</i>
C. <i>Special Research Project</i>	<i>6 credits</i>
D. <i>Intensive Industrial Research Projects</i>	<i>6 credits</i>

2.2 Required Coursework

Summer, Year 1

CHE 654 Computer Application for Chemical Engineering Practice	3 credits
CHE 655 Fundamental of Chemical Engineering Practice	3 credits
LNG 601 Foundation English for International Programs	3 credits
Total	9 credits

Semester 1, Year 1

CHE 610 Intermediate Transport Phenomena	3 credits
CHE 644 Applied Chemical Engineering Thermodynamics	3 credits
CHE 651 Mathematical Analysis for Chemical Engineering	3 credits
CHE 656 Process Analysis and Modeling I	3 credits
CHE 658 Fundamentals of Process Dynamics and Control	2 credits
Total	14 credits

Semester 2, Year 1

CHE 642 Chemical Reaction Engineering	3 credits
CHE 643 Petroleum and Petrochemical Process Chemistry	3 credits
CHE 657 Process Analysis and Modeling II	3 credits
CHE 670 Business Management for Chemical Industry	3 credits
CHE 659 Optimization of Chemical Processes	2 credits
Total	14 credits

Semester 1, Year 2

CHE 691 Intensive Industrial Research Project I	3 credits
CHE 692 Intensive Industrial Research Project II	3 credits
Total	6 credits

Or

CHE 690 Special Research Project	6 credits
Total	6 credits

Semester 2, Year 2

CHE 691 Intensive Industrial Research Project I	3 credits
CHE 692 Intensive Industrial Research Project II	3 credits
Total	6 credits

Or

CHE 690 Special Research Project	6 credits
Total	6 credits

Note that in the second year, some of the students will work on their research projects while others will be interned at practice stations in Semester 1. Their roles are subsequently reversed in Semester 2.

3. Course Descriptions

The following is a summary of course descriptions.

Code/Subject : CHE 610 Intermediate Transport Phenomena

Prerequisite : Fluid mechanics, heat, and mass transfer

3 credit hours Formulation and rigorous analysis of the laws governing the transport processes of momentum, heat and mass. The topics studied include the molecular transport, concept of transport coefficient by shell balance techniques, equations of change for multi-dimensional transport, transport with more than two independent variables, turbulent flow, transport between phases, and macroscopic balances.

Code/Subject : CHE 644 Applied Chemical Engineering Thermodynamics

Prerequisite : Introduction to thermodynamics

3 credit hours Applied thermodynamics, gas-liquid equilibrium, liquid-liquid equilibrium, cubic equations of state such as Peng-Robinson and Redlich-Kwong-Soave, activity coefficient models such as Wilson, NRTL, and UNIQUAC, selection of physical property package in process simulation.

Code/Subject : CHE 642 Chemical Reaction Engineering

Prerequisite : Reaction kinetics

3 credit hours Advanced topics in reactor design: nonideal flow and nonisothermal reactors, effect of mixing on reactor operation, scale up techniques, adsorption and heterogeneous catalysis, optional design of various types of chemical reactor, arrangements and reactor stability analysis.

Code/Subject : CHE 643 Petroleum and Petrochemical Process Chemistry

Prerequisite : Organic chemistry

3 credit hours Review of organic chemistry, organo-metallic chemistry, polymer science and processing, petroleum and petrochemical process and chemistry.

Code/Subject : CHE 651 Mathematical Analysis for Chemical Engineering

Prerequisite : Applied mathematics and differential equations

3 credit hours Mathematical formulation and solution of problems drawn from the fields of heat and mass transfer, fluid mechanics, and reaction kinetics employing ordinary differential equations and partial

differential equations. Analytical solutions and numerical solutions of differential equations.

Code/Subject : CHE 654 Computer Application for Chemical Engineering Practice
Prerequisite : None

3 credit hours History and background of chemical process simulation, sequential modular approach vs. equation-oriented approach, flowsheet partitioning and determination of tear streams, mass balance and degree of freedom analysis using elementary modules, steady-state simulation with ASPEN PLUS including sensitivity analysis, design-specifications, calculator blocks, and flowsheet convergence, in-depth coverage of physical property methods and applied thermodynamics used in simulation, discussion of numerical solvers in ASPEN PLUS such as Wegstein, Secant, Direct, Newton's, and Broyden's methods.

Code/Subject : CHE 655 Fundamental of Chemical Engineering Practice
Prerequisite : Chemical plant design

3 credit hours Review of chemical engineering fundamentals via chemical plant design, problem-based learning (PBL) with teams of students working on different plant design projects to produce assigned chemicals, oral presentations by students, use of ASPEN PLUS as a simulation tool for design, including economic evaluation and profitability analysis.

Code/Subject : CHE 656 Process Analysis and Modeling I
Prerequisite : Process simulation

3 credit hours System and chemical process analysis and modeling using fundamentals of chemical engineering, dynamic mathematical modeling in terms of nonlinear algebraic equations and ordinary differential equations (ODEs), programming in MATLAB and using MATLAB to solve nonlinear algebraic equations and ODEs, problem-based learning (PBL) with design projects from industrial sponsors in the petroleum and petrochemical industries, and oral presentations by teams of students.

Code/Subject : CHE 657 Process Analysis and Modeling II
Prerequisite : Process simulation and modeling

3 credit hours Introduction and fundamentals of optimization, problem formulations, calculus-based optimization, unconstrained optimization, constrained optimization, linear programming, mixed-integer linear programming, branch-and-bound method, and optimization using MATLAB toolbox, problem-based learning (PBL) with design projects from industrial sponsors in the

petroleum and petrochemical industries, and oral presentations by teams of students.

Code/Subject : CHE 658 Fundamentals of Process Dynamics and Control

Prerequisite : Process dynamics and control

2 credit hours Modeling and analysis of the dynamics of chemical processes, Laplace transforms, block diagrams, feedback control systems, and stability analysis.

Code/Subject : CHE 659 Optimization of Chemical Processes

Prerequisite : Fundamentals of optimization

2 credit hours Problem formulation involving process optimization, process optimization using ASPEN PLUS, optimization solvers such as sequential quadratic programming (SQP) and Complex algorithm.

Code/Subject : CHE 670 Business Management for Chemical Industry

Prerequisite : None

3 credit hours Economic and accounting concepts, tools for decision-making and solving the problems in chemical process industries (CPI), basic economics, basic accounting, input-output analysis, marketing, manufacturing, employment, finance, corporate annual reports, project management, environmental aspects of the CPI, international aspects of the CPI, future prospects : threats and opportunities.

Code/Subject : CHE 690 Special Research Project

Prerequisite : Second-year student status

6 credit hours This course is a graduate special research project, with the well defined problem in the area of interest in Chemical Engineering field.

Code/Subject : CHE 691 Intensive Industrial Research Project I

Prerequisite : Second-year student status

3 credit hours Practice school students will be assigned to work within the host company, on the company's problem, using the company's problems with the company's resources and equipment. The student will work under the quittance of resident faculty at the industrial site. The following steps are included the in the activities: problem statements provided by the company with the approval of the resident faculty, writing a written investigative memorandum, proposal conferencing, final report and final presentation.

Code/Subject : CHE 692 Intensive Industrial Research Project II

Prerequisite : Second-year student status

3 credit hours Similar to CHE 691 but on the different topic of equal importance. It requires the work of 3 credits as well.

Code/Subject : LNG 610 Foundation English for International Programs

Prerequisite : None

3 credit hours Basics of English grammar, training in listening, writing, and presentation.

4. Timeline and Important Milestones of ChEPS Program

A ChEPS student will follow one of the following two timelines depending upon the sequence of the on-site practice school and special research on campus.

	Month	Duration	Plan
Year I	January	1 month	Recruitment
	June – July	2 months	Summer session
	August	1 week	Break
	August – December	5 months	First semester
	January	1 week	Break
	January – May	5 months	Second semester
Year II	June	1 week	Break
	July	2 weeks	Thesis proposal
	August – December	5 months	Academic research on campus or practice school on site
	January	1 week	Break
	January – May	5 months	Academic research on campus or practice school on site

5. AR-ChEPS

AR-ChEPS stands for Academic-Research ChEPS, a new initiative created in 2017 by the Department of Chemical Engineering. AR-ChEPS is another special track in the ChEPS program (the other being IR-ChEPS). While IR-ChEPS has successfully addressed the needs of ChEPS students and SCG-Chem, AR-ChEPS was created to also benefit the Department and its thesis advisors. AR-ChEPS students work on thesis projects proposed by faculty members in the Department of Chemical Engineering which allow the work to be published in conference proceedings and journals, thus boosting the KPI of the Department.

The key difference between AR-ChEPS and regular ChEPS is that all AR-ChEPS will undergo a 12-credit-hour of research thesis in which the output must be presented in a

conference proceedings with the option to publish. To accommodate the more intense emphasis on thesis, AR-ChEPS students are required to take only 10 courses instead of the required 13 courses in the ChEPS curriculum and their internship period will be cut in half, from 5 months (one semester) to 2.5 months during the the second year.

Here are additional information about AR-ChEPS:

1. Unlike IR-ChEPS, AR-ChEPS is part of the ChEPS admission process in which applicants who are offered half scholarships (and possibly Soft-loan) are asked if they like to be considered for AR-ChEPS.
2. Once a student is in the AR-ChEPS track, his/her admission is automatically upgraded to Full Scholarship. An additional monthly stipend is also available for 24 months (2 years) for qualified students. For those with GPAs between 3.00 and 3.25, the monthly stipend is 3,000 baht, while those with GPAs above 3.25 will receive a monthly stipend of 6,000 baht.
3. The following ChEPS courses will be waived for AR-ChEPS students:
 - (a) CHE 655: Fundamental of Chemical Engineering Practice (3 credit hours, Summer of Year 1)
 - (b) CHE 643: Petroleum and Petrochemical Process Chemistry (3 credit hours, Semester 1 of Year 1)
 - (c) CHE 657: Process Analysis and Modeling II (3 credit hours, Semester 2 of Year 1), or
CHE 670: Business Management for Chemical Industry (3 credit hours, Semester 2 of Year 1)

6. IR-ChEPS

IR-ChEPS stands for Industrial-Research ChEPS, a new initiative created in 2014 in collaboration with SCG Chemicals Co., Ltd. (SCG-Chem). IR-ChEPS is a special track in the ChEPS program. In contrast to those in the regular track, students put into the IR-ChEPS track will see their 2nd-year thesis project and site projects combined into one 12-month research project. In other words, IR-ChEPS students' practical training or internship will consist of one single project that is sponsored by SCG-Chem. Moreover, while normal site projects involve a team of 2 students, IR-ChEPS projects are based on individual efforts.

Here are some additional facts about IR-ChEPS:

1. IR-ChEPS students are interned in Rayong and live in free housing provided by SCG-Chem for 12 months starting during the first week of June. As a result, these students will be able to move out of their dormitories during their second year in ChEPS.
2. Each IR-ChEPS student will receive a monthly stipend of 10,000 baht for 12 months.

3. IR-ChEPS students are supervised by ChEPS Rayong Site Director. However, a KMUTT professor will be also be assigned to oversee the technical aspects of each project.

4. In terms of course registration, IR-ChEPS will need to register for CHE690, CHE691, and CHE692 just like any other students in the regular track in Semester 1 and Semester 2 of their second year. Furthermore, grades based on the students' performance will be assigned in CHE691 and CHE692.

5. Each year, a total of 4 - 6 IR-ChEPS projects are sponsored by SCG-Chem. All ChEPS students, regardless of their scholarship status, are eligible to apply for IR-ChEPS. ChEPS students who express interest in the IR-ChEPS track will be interviewed and selected by SCG-Chem based on the company's requirements and criteria. ChEPS will have no say or influence in this decision-making. The interview usually takes place a few months before the beginning of IR-ChEPS projects in June.

CHEPS POLICIES

The ChEPS program regards all its students as professionals and trusts them with their ethical judgement. However, certain policies have to be laid out beforehand to maintain an atmosphere of equality and fairness for all.

1. Policies for On-Campus Program

On campus, all academic work such as homework assignments or tests or individual projects should be done according to the guidelines provided by the course instructor. A student who uses improper means to complete the academic work should do so at his/her own risk. In the event of discovery of such an incident, a severe disciplinary action will be taken against the involved student(s) and multiple incidents of this nature may lead to expulsion from the program.

While the ChEPS program offers several facilities and equipment to its students for completing their academic work, each student is also required to own a personal laptop. Students must use these facilities responsibly and report any misuse to one of the ChEPS faculty or staff members as soon as possible. The following are the specific guidelines for the use of the ChEPS facilities:

1. The ChEPS facilities, including computers and LCD projectors, are meant for only ChEPS graduate students. Unauthorized use by an **OUTSIDER** should be reported to a ChEPS faculty or staff as soon as possible.
2. The ChEPS students must use the ChEPS facilities, including computers, for doing their academic work only.
3. Students are **NOT** permitted to install unauthorized software or other programs on the ChEPS computers. Also, students are **NOT** allowed to change major hardware/software configurations on any of the ChEPS computers or other equipment without prior approval from the ChEPS administration.
4. The ChEPS program will tolerate only normal wear and tear of the equipment used by the ChEPS students. Therefore, students must handle the ChEPS equipment, including computers, in a proper manner to avoid any damage. The students may be **FINED FINANCIALLY** for excessive damage to the ChEPS equipment, including computers, resulting from improper handling/use.

2. Policies for On-Site Program

The ChEPS students work within the company and on the company's problems using the company's resources and equipment, but they are not company employees. Rather,

the students work for academic credit under the guidance of site-director/resident faculty at the site.

Although the students act like company employees while working on site, they are not subjected to any leave or other benefits that the company offers to its employees. The students have to follow the schedule of the ChEPS program. In case of an emergency, the student should notify the site director/resident faculty as soon as possible.

CHEPS OPERATING PROCEDURES

1. Admission

Completing the academic, research, and extra-curricular requirements of the ChEPS graduate program requires hard work, dedication, persistence, creativity, and an ambition to excel. For this reason, only the best students are being sought who can meet the high standards set by the program.

The admission procedure is a multi-step process and may involve visits of the ChEPS faculty members to various universities for student recruitment, applications screening, and interviewing. Prospective students should apply by submitting a completed application form before a deadline set forth by the program. This deadline is usually at the end of December.

2. Design Problems (PBL Projects)

All students are trained during the first year at KMUTT in order to be prepared for the practice school in the second year. The training comes in two forms, namely coursework and problem-based learning (PBL), a.k.a. design problems. The coursework consists of 12 courses typical in a normal Master's program in Chemical Engineering. The design problems may be thought of as mini-site-projects. There is one design problem (per student group) in each semester in the first year. The objective is to better prepare the students by familiarizing them with real-life problems, though smaller in scale than site projects, and training them in report writing and oral presentations.

2.1 Nature of Design Problems

The following are some guidelines for the design problems that ChEPS is looking for:

- (a) The design problem should come from a real process or operation. An ideal candidate is one which is too small to be made into a site project and yet the company is still interested in finding a solution.
- (b) The problem should be well-defined (as opposed to being open-ended), and its scope should be such that it can be completed by a team of 3-4 students within 8 weeks working on a total of approximately 30 hours per week.
- (c) The problem should involve some sort of simulation and optimization, and may require the use of a simulation package such as PRO/II or ASPEN PLUS. In some rare cases, the students may have to develop their own program to solve parts of the problem.

2.2 Role of the Corporate Sponsors

ChEPS will initiate the first contact with its corporate sponsors to solicit a number of design problems. Once the companies agree to participate, an engineer should be appointed to be the focal contact person. ChEPS would then organize a meeting between the students and the company engineer, in which the students are briefed about the problem and given some technical data. This usually takes place at the company. Subsequent visits to the company may be necessary to obtain more data. During the duration of the project, students are encouraged to contact the company engineer by emails or fax if further clarifications are needed. However, the students may contact the company engineer by telephone only after the engineer agreed to it. The students should in no way interrupt or interfere with the daily work routine of the company engineer.

2.3 Format of Design Problems

A group of 3-4 students will work in team on one design problem. There is no team leader and each group member is expected to contribute equally to the project. A total of 8-10 weeks will be allocated to solving the problem, which usually is the last two months of an academic semester. One or more advisors, usually a KMUTT staff, are assigned to oversee each project. The advisors ensure that satisfactory progress is being made and assist the students in both technical problems and writing. During the 8-10 weeks of the projects, progress is monitored with bi-weekly discussions, reports, and oral presentations. The company engineers need not participate in these activities which take place at KMUTT. At the end of the 8-10 weeks, the design problem will culminate in a Final Presentation in which the students present their findings to the sponsors. This usually takes place at the sponsoring company.

3. On-Site Practice Problems

Following two semesters of graduate lectures on campus, students spend one semester in the second year of their program at a Practice School site. A feature that distinguishes the ChEPS from other programs that cooperate with industry is the presence of full-time faculty resident at the industrial sites where students work. Selected ChEPS faculty members serve as the site directors. In addition, faculty members from the main campus regularly visit the sites to attend presentations and to advise the students on technical matters. Engineering staff from the industrial plant outline possible projects to the resident faculty and serve as consultants. The site directors screen potential problems based on the following three criteria:

- The project should have sufficient educational value for the student by stressing the application of chemical engineering fundamentals.
- The solution should require a broad range of skills, including technical ability, original thought, initiative and judgement.
- The results should be useful to the host company and achievable in the time allotted.

The site projects may have an experimental component involving collection and analysis of data. Frequently, they will involve direct use of process-scale equipment.

There is an on-site practice school handbook that describes in details the on-site practice school operation and its academic requirements. A student must obtain a copy this on-site practice school handbook from the ChEPS administrative office.

4. Academic Project or Thesis Research

The ChEPS students work on their thesis research individually for one semester during the second year of the program under the guidance of a thesis committee. The committee members monitor the student's progress on a regular basis towards a successful completion of the thesis research. The student is required to submit copies of a written thesis to all the committee members at least one week in advance of the scheduled final thesis examination.

All available research topics will be announced and posted by ChEPS faculty sometime in February of the second year. All second-year students, regardless of whether they will conduct their research on campus in the first or second semester, must submit and defend their research thesis proposals in mid-July. After that, about half of the students will be interned at practice stations, while the remaining will stay behind at KMUTT to carry out their research. For those working on research, there will be a total of two progress presentations, approximately one every 6 weeks, to keep the advisor and the research committee abreast of their work. A progress written report is also expected to be submitted one week before the oral presentation. All students must defend their research project at the end of the five-month period. In the unlikely event that a student is unable to complete his or her work in the allotted five months, an extension into the summer of the second year may be granted. However, the student may be asked to pay for the extra tuition fee in the summer or even fined 50,000 baht if the delay is a direct result of negligence or poor performance by the student.

5. Graduation

A total of 49 credits are required for graduation from the ChEPS program. The second year academic research project or thesis is awarded 6 credits and so does the practical training undertaken at the industrial site. The remaining 37 credits should be completed through various core courses offered by the ChEPS program. After completing all the academic and research requirements of the program, a student receives a Master's Degree of Engineering in Chemical Engineering.

In addition to the required credit hours, ChEPS students are required (both university policy and ChEPS policy) to pass an English proficiency test before graduation by making the following score on the English test:

- 500 on the ITP-TOEFL (paper-based) offered by the School of IT at KMUTT

However, ChEPS students who took LNG601 automatically fulfill the university's English requirement but not the ChEPS' requirement. To fulfill the ChEPS' English requirement, each student must score at least 500 once on the paper-based TOEFL (PBT), which can either be administered by ChEPS (the students' admission PBT scores can be used for this purpose) or be taken at the School of IT at KMUTT.

Alternatively, a ChEPS student may take an official TOEIC (Test of English for International Communication) test and must score at least 650 in order to fulfill the ChEPS' English requirement.

RULES AND PROCEDURES OF CHEPS SPECIAL RESEARCH PROJECTS

1. Rules for Special Research Projects

1. ChEPS staff will post topics, advisor(s), co-advisor(s), thesis committee, and timetable for presentations during the 3rd week of February.
2. Students should inform ChEPS administration about the selection of their research topics and begin their theses by the beginning of March.
3. Each student is required to give a proposal presentation by the middle of July.
4. Each student is required to give two progress presentations and a thesis defense presentation, which are evenly spread out during the five-month duration of the research.
5. For each presentation, students are required to inform the ChEPS administration about the date and the time at least three days before the presentation.
6. Students are required to submit a written report (e.g. proposal, progress, etc.) to the thesis committee at least three days before each presentation.
7. Each student is required to submit a draft copy of the thesis report to the committee and to the ChEPS administration at least one week before the thesis defense date.
8. Students are required to submit the Thesis Committee Confirmation Form to the ChEPS office before all presentations.
9. Students should submit a proposal form (U.1) including the advisor's signature to the ChEPS administration after the proposal presentation.
10. Students should have the committee members sign the U.2 form after their presentations on the thesis progress date.
11. Students are required to submit a U.1 form including the advisor's signature to the ChEPS administration at least three weeks before the thesis defense.
12. Students should have the committee members sign the U.3 form after their presentations on the thesis defense date.
13. Students must correct their thesis final reports and submit them to the Faculty of Engineering within 30, 45 or 60 days (at the discretion of the committee)

after their thesis defense date.

14. Some research projects may offer extra stipends to the students. Students who receive monthly stipends (as loan) from ChEPS will not receive this extra money directly. Instead, the extra money will be deducted from the outstanding balance that the students owe to ChEPS upon their graduation. For those who do not borrow monthly stipends from the program, the extra money from the research group will be transferred directly to the students' bank accounts.
15. Some research projects may involve overseas collaboration and require that students spend a few months conducting research at an overseas institution. In such cases, it is the students' responsibilities to shoulder the costs and expenses of these trips. However, some overseas collaborators will provide small allowances to the student, while ChEPS will partially sponsor the airfare of the trip. The exact amount depends on the geographical location of the overseas universities.

Notes:

- Any student who does not follow these regulations will not be allowed to complete his/her thesis in one semester, unless prior exception is granted by the ChEPS staff.
- **If the students fail to complete the research in one semester due to poor performance and negligence, they will be fined 50,000 bath to maintain their status as KMUTT students.**
- ChEPS staff can help students with technical writing, particularly with the thesis reports. However, such students will need to contact the technical writing advisor early in the semester to work out a writing timetable.

2. Thesis Advisor(s) and Committee

Each research project will have at least one advisor. Some projects may have co-advisors.

A thesis proposal and a thesis defense require that a committee be present to evaluate the student's work. The research advisor will recommend and select committee members based on their expertise and qualifications in the field of research. The minimum number of committee for each research project is two. One of the committee members must come from inside ChEPS/ChE Department. Industrial sponsors can be committee members, provided that they have Master's or PhD degrees and must possess expertise in the field of research.

FREQUENTLY USED FORMS

The forms that are frequently used by ChEPS students for various purposes are available for downloads from the website of Faculty of Engineering at:

<https://www.taiwan-thailand-he-forum.com/>

CHEPS FACULTY MEMBERS AND STAFF

CHEPS ADVISORY BOARD



1. **NAME** : Assoc. Prof. Dr. Sakarindr Bhumiratana
JOB TITLE : Senior Advisor to the President
INSTITUTE : King Mongkut's University of Technology
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District, Bangkok 10140

TEL : 02-470-8020
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RESEARCH AREAS/INTEREST

- Biogas research and development
- Transport properties of food materials
- Algal technology
- Research management, strategic and socio-economic activities



2. **NAME** : Assoc. Prof. Dr. Suvit Tia
JOB TITLE : University President
INSTITUTE : King Mongkut's University of Technology
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TEL : 02-470-8023
FAX : 02-872-9087
E-mail : suvit.tia@kmutt.ac.th

RESEARCH AREAS/INTEREST

- Pyrolysis and combustion of solid fuels, fluidized bed combustion
- Thermal storage and processing
- Energy conservation and management
- Design and development of chemical processes



3. **NAME** : Assist. Prof. Dr. Hong-ming Ku
JOB TITLE : Director and Lecturer of Chemical Engineering Practice School (ChEPS), Department of Chemical Engineering
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TEL : 02-470-9616, 02-470-9611

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RESEARCH AREAS/INTEREST

- Process simulation and modeling
- Process optimization
- Optimization techniques and algorithms
- Engineering education such as PBL and design of practice-based curricula

CHEPS LECTURERS



1. **NAME** : Assoc. Prof. Dr. Asawin Meechai
JOB TITLE : Associate Professor and Secretariat, Chemical Engineering Practice School (ChEPS), Department of Chemical Engineering
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RESEARCH AREAS/INTEREST

- Applying metabolic engineering, systems biology and bioinformatics approaches to understand complex mechanisms in *Saccharomyces cerevisiae*, *Mucor rouxii*, *Spirulina platensis*, *Plasmodium falciparum*, *Mycobacterium tuberculosis*, and Cassava.



2. **NAME** : Dr. Saranya Thonglek
JOB TITLE : Learning Specialist, Chemical Engineering Practice School (ChEPS), Department of Chemical Engineering
Head of KMUTT's WIL Office
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RESEARCH AREAS/INTEREST

- Engineering education and work-integrated learning (WIL)



3. **NAME** : Assoc. Prof. Dr. Thongchai Srinophakhun
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RESEARCH AREAS/INTEREST

- Computer-aided process engineering
- Petroleum and petrochemical process simulation and system analysis
- Advanced control theories
- Advanced computational algorithms



4. **NAME** : Assoc. Prof. Dr. Kwanchanok Pasuwat
JOB TITLE : Associate Professor, Chemical Engineering Practice School (ChEPS), Department of Chemical Engineering
Chair of Bioengineering Program (BIE)
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RESEARCH AREAS/INTEREST

- Controlled release of anticancer drugs from a biodegradable polymer system
- Microfluidics biosensor detection system



5. **NAME** : Assoc. Prof. Dr. Supaporn Therdtianwong
JOB TITLE : Associate Professor, Department of Chemical Engineering
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RESEARCH AREAS/INTEREST

- Catalyst preparation and characterization
- Catalysis and chemical reaction engineering
- Clean/alternative fuel production
- Fuel cells technology
- Trouble-shooting and process simulation in petroleum and petrochemical industry

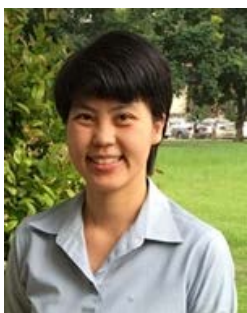


6. **NAME** : Dr. Chutima Kongvarhodom
JOB TITLE : Lecturer, Chemical Engineering Practice School (ChEPS), Department of Chemical Engineering
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RESEARCH AREAS/INTEREST

- Corrosion
- Computational fluid dynamics modeling
- Plating and nuclear nonproliferation
- Safeguards and security



7. **NAME** : Dr. Paritta Prayoonyong
JOB TITLE : Lecturer
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RESEARCH AREAS/INTEREST

- Separation process design
- Heterogeneous azeotropic distillation
- Hybrid separation processes
- Development of separation and purification technologies in biofuel production



8. **NAME** : Dr. Nonsee Nimitsiriwat
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RESEARCH AREAS/INTEREST

- Polymer synthesis
- Chemical modification of polymers



9. **NAME** : Assist. Prof. Dr. Amornmart Sirijaruphan
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RESEARCH AREAS/INTEREST

- Catalysis

CHEPS SPECIAL LECTURERS



1. **NAME** : Prof. Peter L. Douglas
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RESEARCH AREAS/INTEREST

- Process simulation, process control, and process synthesis
- Large-scale process optimization and real-time optimization (RTO)
- CO₂ mitigation technologies
- Post harvest grain technology



2. **NAME** : Prof. Dr. Juergen Rarey
JOB TITLE : Professor and Director of DDBST GmbH
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ADDRESS :

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RESEARCH AREAS/INTEREST

- Applied thermodynamics

CHEPS ADMINISTRATIVE STAFF



1. **NAME** : Ms. Chadaporn Dammunee
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CHEPS INDUSTRIAL SPONSORS & CONTACT INFO

1. Bangkok Synthetics Co., Ltd. & BST Elastomers Co., Ltd. (BST)

URL: www.bst.co.th

Head Office:

175 Sathorn City Tower 22nd Fl., South Sathorn Road, Tungmahamek,
Sathorn, Bangkok 10120.

Tel: (662) 679-5120

Fax: (662) 679-5119

Factory:

5 I-7 Rd., Map ta Phut Industrial Estate, Muang district,
Rayong 21150.

Tel: (038) 683-314

Fax: (038) 683-315

2. Energy Policy and Planning Office (Eppo)

URL: www.eppo.go.th

121/1-2 Phetchaburi Road, Ratchathewi, Bangkok 10400, Thailand

Tel: 0 2612-1555

Fax: 0 2612-1358

From outside Thailand : Tel +66 2612-1555, Fax +66 2612-1358

3. ExxonMobil Limited

URL: www.exxonmobil.com/usa-english/hr/siteflow/thailand.asp

118 Moo 2, Sukhapibal 7 Road

Tung Sukia, Sriracha, Chon Buri 20230

Tel: (038) 483-900

Fax: (038) 493-940

4. National Science and Technology Development Agency (NSTDA)

URL: www.nstda.or.th

111 Thailand Science Park, Paholyothin Rd., Kong 1,
Klong Luang, Pathumthani 12120, Thailand

Tel: 0-2564-7000

Fax: 0-2564-7001 – 5

Call Center: 0-2564-8000

5. Rayong Olefins Co., Ltd. (ROC)

Head Office:

The Siam Cement Public Co., Ltd. (**Headquarter**)

URL: www.siamcement.com

1 Siam Cement Road, Bangsue, Bangkok 10800 Thailand

Tel: 66-2586-4444, HomeMart

Call Center Tel: 66-2586-2222

Rayong Plant:

271 Sukhumvit Road, Map Ta Phut, Muang, Rayong

Tel: 0-3868-5040-8, 0-3891-1480-5

Fax: 0-3891-1489

6. Petroleum Institute of Thailand (PTIT)

URL: www.ptit.org

18th Floor, PTT Building

555 Vibhavadi Rangsit Road,

Chatuchak, Chatuchak , Bangkok 10900

Tel: 66 (0) 2 537 3592-8

Fax: 66 (0) 2 537 3591

7. PTT Global Chemical Public Co., Ltd. (PTT-GC)

URL: www.pttgcgroup.com

Head Office:

123 Suntowers Building B, 31 st – 35 th Floor,

Vibhavadi Rangsit Road , Chomphon, Chatuchak, Bangkok 10900

Tel: +66 (0) 2265-8400 Fax: +66 (0) 2265-8500

1st Branch: (Suntowers A Branch)

123 Suntowers Building A, 14 th, 18 th Floor,

Vibhavadi Rangsit Road , Chomphon, Chatuchak, Bangkok 10900

Tel: +66 (0) 2265-8100

Fax: +66 (0) 2265-8111

2nd Branch: (I-1 Road Branch)

14 I-1 Road, Tambon Map Ta Phut,

Amphoe Mueang Rayong, Rayong 21150

Tel: +66 (0) 3892-2100

Fax: +66 (0) 3892-2111

3rd Branch: (I-4 Road Branch)

9 I-4 Road, Tambon Map Ta Phut, Amphoe Mueang Rayong,

Rayong 21150

Tel: +66 (0) 3892-2000

Fax: +66 (0) 3892-5600

4th Branch: (Jetty and Buffer Tank Farm Branch)

19 Rong Pui Road, Tambon Map Ta Phut, Amphoe Mueang Rayong, Rayong 21150

Tel: +66 (0) 3892 2750

Fax: +66 (0) 3892 2760

8. PTT Research and Technology, Wangnoi

URL: www.pttplc.com/en/

71 Moo 2, Phahonyothin Road km. 78,

Wangnoi, Ayutthaya 13170

Tel: 66(0) 2537-3000

Fax: 66(0) 2537-3000

9. Siam Mitsui PTA Co, Ltd. (SMPC)

Head Office:

The Siam Cement Public Co., Ltd. (**Headquarter**)

URL: www.siamcement.com

1 Siam Cement Road, Bangsue, Bangkok 10800 Thailand

Tel: 66 2586 4444, HomeMart Call Center Tel. 66 2586-2222

Rayong Plant:

8 Soi G-2 Eastern Industrial Estate, Prakornsongkroraj Rd., Huaypong, Muang District,
Rayong 21150

10. Thai Oil Public Co., Ltd.

URL: www.thaioil.co.th

Head Office:

123 Suntowers Building B, 16th Floor,

Vibhavadi Rangsit Road, Chomphon, Chatuchak,

Bangkok, 10900 Thailand

Tel: 66(0) 2617-8300, +66(0) 2299-0000,

Fax: +66 (0) 2299-0024

Refinery:

42/1 Moo 1 Sukhumvit Road Km. 124,

Tungskla, Sriracha, Cholburi 20230, Thailand

Tel: +66(0) 3840-8500, +66(0) 3835 9000, +66(0) 3835-1555

Fax: +66(0)3835 1554, +66(0) 3835-1444, +66(0) 3835-9019

11. Thai Plastic and Chemicals Public Co, Ltd. (TPC)

URL: www.thaiplastic.co.th

Head Office:

14-15th Floors, Rajanakarn Building
183 South Sathorn Rd., Yannawa
Sathorn, Bangkok 10120 Thailand
Tel: 66 (02) 676-6000
Fax: 66 (02) 676-6077

Samut Prakan Factory:

19 soi Tesaban Samrong Tai 21, Poochaosamingprai Rd.
Bangyapraek, Prapradaeng
Samut Prakan 10130 Thailand
Tel: 66 (02) 385-9459, 66 (02) 385-9468
Fax: 66 (02) 385-9458

Rayong Factory:

8, I-1 Rd., Mab Ta Phut Industrial Estate
Tambon Mab Ta Phut, Amphoe Muang
Rayong 21150 Thailand
Tel: 66 (038) 683-900
Fax: 66 (038) 683-392

12. Thai Polyethylene Co., Ltd. (TPE)

Head Office:

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Tel. 66 2586 4444, HomeMart Call Center Tel. 66 2586 2222
Rayong Plant
10 I-1 Road, Map Ta Phut Industrial Estate, Map Ta Phut, Muang District, Rayong
21150

13. PTT Aromatics and Refining Public Co., Ltd. (PTT-AR)

URL: www.pttar.co.th

Head Office:

555, 2nd Floor, PTTEP Office Building,
Vibhavadirangsit Road, Chatuchak,
Chatuchak, Bangkok 10900, Thailand.
Tel: 0-2537-5700
Fax: 0-2936-3097

Rayong Plant:

4, I-2 Road,
Map Ta Phut Industrial Estate,
Muang District, Rayong 21150, Thailand.
Tel: 0-3868-3683, 0-3891-8100
Fax: 0-3868-3695, 0-3868-3696