Doctor of Philosophy Programme in

Electrical and Computer Engineering

International Programme
Curriculum Revision 2022 (2565 B.E.)

Computer Engineering Department

Faculty of Engineering

King Mongkut's University of Technology Thonburi

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Doctor of Philosophy in
Electrical and Computer Engineering (International Programme)
Curriculum Revision 2022

University **King Mongkut's University of Technology Thonburi**

Faculty/Department **Faculty of Engineering, Computer Engineering Department**

Section 1 General Information

1. Programme Code and Title

1.1 Code **25500141111835**

1.2 Name of the Program: Doctor of Philosophy Programme in Electrical and Computer Engineering (International Program)

2. Degree Offered and Field of Study

2.1 Full Title : Doctor of Philosophy (Electrical and Computer Engineering)

(in Thai) : ปรัชญาดุษฎีบัณฑิต (วิศวกรรมไฟฟ้าและคอมพิวเตอร์)

2.2 Abbreviation : Ph.D. (Electrical and Computer Engineering)

(in Thai) : ปร.ด. (วิศวกรรมไฟฟ้าและคอมพิวเตอร์)

3. Major/Field of Study (If any)

None

4. Total Credit Requirements

For applicants who have bachelor or master degrees in electrical engineering, computer engineering, computer science, applied science or equivalent.

Plan A1: For qualified applicants who already have master degree, the minimum required credits are 48 credits. No courses are required for the credits.

Plan B1: For qualified applicants who already have master degree, the minimum required credits are 48 credits. Taking courses is required for the credits.

Plan B2: For qualified applicants who have only bachelor degree, the minimum required credits are 75 credits. Taking courses is required for the credits.

The applicants' qualification is described in Section 3, topic 2.2.

5. Programme Format

5.1 Degree Level Doctoral degree

5.2 Language English language

5.3 Admission

Both Thai and foreign applicants are eligible to apply to the program in accordance with the admission and enrolment policy of the university.

5.4 Collaboration with Other Institutions

Name of Institution	Country
With MOU	
Macquarie University (Sydney)	Australia
Shibuara Institute of Technology, Tokyo	Japan
Without MOU	
Hamburg University of Technology	Germany
Virginia Polytechnic Institute and State University	U.S.A.

5.5 Degree Offered

Ph.D. (Electrical and Computer Engineering)

There is only one degree awarded in this study programme. No jointed degree with other university/institution.

6. Programme Status and Programme Permission/Approval

The programme begins in August 2022 (2565 B.E.),

Semester 1 Academic year 2022 (2565 B.E.)

The programmed was initially established in June 1997 (2540 B.E.)

The programme has been revised from the previous version of the academic year 2017, and will be applied in semester 1 of the academic year 2022.

The University Academic Committee granted programme approval at meeting No. ...2.../...2565...On.....14..... February.....2022.... (2564 B.E.)

- The University Council granted permission at meeting No. ……270…….

on …2… March……2022 (2564 B.E.)

The programme has been revised from the previous version of
Doctor of Philosophy in Electrical and Computer Engineering (International Programme) Curriculum Revision 2017

7. Expected Date for the Implementation of Programme

The programme is ready to be publicly disseminated its excellence and standardization based on:

■ Thai QF for Higher Education (TQF) B.E. 2552

This curriculum is ready to be publicly disseminated as a programme and in accordance with National Qualifications Framework for Higher Education 2009 (B.E. 2552) in the academic year 2023 (B.E. 2566).

8. Carrier Opportunities after Graduation

1) University professor and scholar
2) Researcher in university, industry, state enterprise or private company
3) R&D personnel in state enterprise or private company
4) Consultant/advisor/specialist in an academic or private company
5) Business owner

9. Name, Academic Position, and Qualifications of lecturers in charge of the programme

No	Name-Surname	Qualifications of lecturers
1	Assoc. Prof. Dr. Naruemon Wattanapongsakorn	- Ph.D. (Electrical Engineering), University of Pittsburgh, U.S.A. (2000) - M.Eng. (Electrical Engineering), George Washington University, U.S.A. (1995) - B.Eng. (Computer Engineering), George Washington University, U.S.A. (1994)
2	Asst. Prof. Dr. Sumate Naetiladdanon	- Ph.D. (Electrical Engineering), Osaka University, Japan (2006) - M.S. (Electric Power Engineering), Rensselaer Polytechnic Institute, U.S.A. (1998) - B.Eng. (Electrical Engineering), Chulalongkorn University, Thailand (1995)
3	Asst. Prof. Dr. Werapon Chiracharit	- Ph.D. (Electrical and Computer Engineering), King Mongkut's University of Technology Thonburi, Thailand (2007) - M.Eng. (Electrical Engineering), King Mongkut's University of Technology Thonburi, Thailand (2001)

No	Name-Surname	Qualifications of lecturers
		- B.Eng. (Electronic and Telecommunication Engineering), King Mongkut's University of Technology Thonburi, Thailand (1999)
4	Dr. Tanagorn Jennawasin	- Ph.D. (Information Science and Technology), The University of Tokyo, Japan (2008) - M.Sc. (Information Science and Technology), The University of Tokyo, Japan (2005) - B.Eng. (Electrical Engineering), Chulalongkorn University, Thailand (2001)

10. Study Location

Rooms and facilities of four departments in the Faculty of Engineering, King Mongkut's University of Technology Thonburi, are utilized. The four departments are Computer Engineering, Electrical Engineering, Electronics and Telecommunication Engineering, and Control System and Instrumentation Engineering.

11. External Situation and/or Development Considered in Programme Planning

11.1 Economic Circumstances/Development

The economic situation that should be considered in curriculum update/revision, is dependent on the draft of the 13th National Economic and Social Development Plan (2023-2027) which will help transform the country. It has five main goals as follows.

1. Restructuring of production, into an economy based on innovation that aligns with technology trends and global trade

2. Developing human resources to have the ability and quality of life suitable for the new world

3. Creating a society of opportunity and fairness

4. Creating sustainability for the country

5. Preparing the country to cope with risks and changes in a new global context

Thailand's economic model is aimed at pulling the country out of the middle-income trap, and developing it as a high-income country. The new Thailand's economic structure will be based on knowledge, technology and innovation. According to global megatrends, which are 1) Advancements in technology and innovation, 2) Changes in population structure, 3) Health care and medical treatment, 4) Climate change, 5) Global efforts to reduce greenhouse gas emissions,

6) Renewable energy and electric vehicles,

7) International political economy trends,

8) Changes in lifestyle and social culture,

9) Occupations in future and

10) Urbanization

These will affect or influence the country situation and lead to the direction of the national development. However; since the COVID-19 crisis in 2020, the needs for digital technology and disruptive innovation for the 4th industrial revolution are accelerated ito stay competitive in any sector. The 13 targeted strategic plans have been drafted in order to achieve a value-creating economy as well as a sustainable society. The related strategic plans are as follows:

1. Electric vehicle production base
2. One-stop service medical and health center
3. Smart electronics production and digital service base
4. Circular economy and low-carbon society of Thailand

The continuous investment in research and development of advanced knowledge and technology will support the new economy. The disruptive-technology knowledge such as smart devices, robotics, mechatronics, cyber security, internet of things, artificial intelligence, embedded technology, energy storage, renewable energy, etc., will play the important role in these strategic plans. The integration of this essential knowledge must be included in the curriculum which emphasizes on producing the graduates that answer to the country's sustainable development. According to the draft of the 20-year strategic plan of human resources development in research and innovation (2017-2036) by the National Research Council of Thailand (NRCT), the Ph.D. graduates in sthe cience and technology field are needed for the target S-curve industries. Thus, this curriculum has been in charge revised intoe aligned with the national development strategy. The qualified graduates that are capable of advanced research and development, will create new knowledge and innovation by integrating local knowledge with academic knowledge. The graduates will also be aware of the intellectual propertyin charge to prevent the intellectual property infringement.

11.2 Social and Cultural Circumstances/Development

Advanced disruptive technologies can be regarded both as tools to reduce inequality while enhancing Thailand's competitive edge, and as threats to the country's development. The impact on society and culture due to the global megatrends as stated before are in many aspects. There is a prediction that the digital transformation will make people in chargewith connected devices nearly 4,800 times a day (or once in every 18 seconds) in 2025. The gigantic amount of data that will come from sources like cloud, on-premise centers, cell towers, endpoints such as smartphones, and IoT devices alone is expected to account for more than 50% of total data creation. The change in people's behaviur as the work-from-home transformation or the online shopping are also the demand for the technology development. The need for smarter solutions and energy-efficient living will drive and foster clusters of smart communities so called smart cities. The effects of climate change, especially disasters, will leave many cities in both the developed and developing world vulnerable. This curriculum also concerns the impact on society and culture from the new technologies as well as the environmental effect. The green technologies (such as renewable energy or electric vehicle) with the government policy will become competitive and provide a new living society. Thus, this new curriculum will provide knowledge together with morals, leaderships, honesty, social responsibility and team working skills.

12. The Effects Mentioned in Nos. 11.1 and 11.2 on Programme Development and Their Relevance to the Mission of the University.

- More new elective classes should be added with high flexibility

The courses include subjects related to advanced artificial intelligence, big data analytics, renewable energy and energy consumption, security with blockchain technology, multimedia communications and other hot topics.

- Three different study plans and publication requirements for students to select.

12.1 Programme Development

Due to the impact from the external situation, the programme needs the potential active development that can be adapted to the technology evolution and be able to support the domestic and international business competition. The graduates in electrical and computer engineering field must be ready to work with the self-development capability in academic or professional work. To create the new knowledge and innovations, knowledge from various fields must be integrated into the new curriculum. The quality of graduates must reach the international standard with the ability to communicate efficiently. Proficiency in English such as English communication skills are required in the study. The minimum TOEFL (Test of English as a Foreign Language) score required is 550 and used as one of the criteria for graduation. Modern elective or special-topic courses should be provided based on the present demand. Examples of the courses are advanced artificial intelligence, deep learning, multimedia communications, image processing and computer vision, and adaptive control of smart electrical systems.

12.2 Related Institutional Missions

The currdegrees development will be in accordance with the university policy as "Towards Excellence in Technology and research", which is conformed to the draft of the 13th National Economic and Social Development Plan (2023-2027). The qualified graduates must be capable of advanced research and development and their degree qualification are conformed to the vision and mission of the university. In addition, the requirement of English proficiency in this curriculum will be the force that drives KMUTT toward international excellence.

13. Cooperation to other programmes offered by other Faculties in the University

13.1 Groups of subjects/courses in this programme offered by other faculties/ departments/ courses

This curriculum is a co-curriculum from 4 departments in the faculty of engineering. The four departments are Computer Engineering, Electrical Engineering, Electronic and Telecommunication Engineering, and Control System and Instrumentation Engineering. Students in any of these departments can take courses available in the curriculum. Students from other departments or faculties can also take the available courses.

13.2 Groups of courses in the programme offered for other departments to study.

No course is required for students in other programme to study. However, they can ask to join/take courses offered by this programme.

13.3 Programme Management

The computer engineering department is authorized by the other three departments in the curriculum to manage and operate the curriculum in accordance with regulations and policies from the faculty of engineering, KMUTT. The curriculum committee consists of representatives from the joined departments.

Section 2 Programme Specification

1. Philosophy, Significance, and Objectives of the Programme

1.1 Programme Philosophy

The Doctor of Philosophy Programme in Computer and Electrical Engineering (International Programme) is designed to develop professionals who have the knowledge, intellectual disposition, ethical sensibilities, and research skills particularly in the field of Computer, Electronics and Telecommunications, and Control System and Instrumentation Engineering. They should be able to apply their knowledge to solve advanced engineering problems as well as to independently learn new technologies. In addition, they should have knowledge transfer skills to provide consultancy services for the sustainable development of the country.

1.2 Significance of the Programme

Electrical, electronic, telecommunication, control and computer (EETCC) scholars and engineers play an important role in the development of advanced technologies and innovations which are a vital foundation of information technology and telecommunications of the country. In the current global situations, massive on-line data and terrorism threat is increasing everywhere including in Thailand. The EETCC scholars and engineers are even more essential to advance data analytic, visualization, detection and prevention technologies for efficient data processing-handling and national security. In addition, we are concerned with energy conservation, renewable energy, reliable and optimal system design. To escape the middle-income trap, Thailand needs extensively qualified personals to increase its competitiveness, especially in the research and development sectors.

1.3 Objectives of the Programme

1.3.1 To produce electrical, electronic, telecommunication, control and computer scholars/engineers, at the doctoral level, who have professional knowledge and skills in research and development.

1.3.2 To produce electrical, electronic, telecommunication, control and computer scholars/engineers who have good international communication skills for effective technology transfer with professional ethics and research ethics.

1.4 Programme-Level Learning Outcomes: PLOs

The success of the programme is evaluated from the programme learning outcomes. At the end of the programme, graduates should be able to:

PLO 1: Evaluate existing knowledge, technologies and research problems in electrical, electronic, telecommunication, control and/or computer engineering.
PLO 2: Achieve new knowledge with research ethics to improve or invent an advanced algorithm or a technique (innovation) to solve a research problem or an industrial problem in electrical, electronic, telecommunication, control and/or computer engineering area.

PLO 3: Communicate effectively with ethical standards including research ethics and professional ethics through technical meetings, reports, proposals, and oral presentations.
Sub PLO 3A: Develop technical/research proposal and/or research reports in detail including problem statement, related literature and technology reviews as well as possible research contribution in the study area with ethical standards.
Sub PLO 3B: Communicate the knowledge and technologies effectively through technical meetings, and oral presentation with ethical standards.

Description of Levels of PLOs
A program learning outcome has multiple levels as follows, where PLO 1 and PLO 2 each has two levels and PLO 3 has three levels.

PLO 1 level 1:
Obtain existing knowledge and technologies in electrical, electronic, telecommunication, control and/or computer engineering.
PLO1 level 2:
Evaluate existing knowledge, technologies and research problems in electrical, electronic, telecommunication, control and/or computer engineering.

PLO 2 level 1:
Apply the obtained knowledge, skill, or advanced algorithm/technique to solve a research problem or an application/industrial problem. The problem must be well-defined with valid input, experimental design and valid output. The problem can be solved by simulation of experiments or with actual implementation. Result validation and performance evaluation are required.

PLO 2 level 2:
Achieve new knowledge with research ethics to improve or invent an advanced algorithm or a technique (innovation) to solve a research problem or an industrial problem in electrical, electronic, telecommunication, control and/or computer engineering area. The problem must be well-defined with valid input, experimental design and valid output. The problem can be solved by simulation of experiments or with actual implementation. Result validation and performance evaluation are required and they are acceptable with national and international standards verified by the dissertation committee members.

Sub PLO 3A level 1:
Review research problems with extensive analysis in written form through technical reports.
Sub PLO 3A level 2:
Develop technical/research proposal and/or research progress including problem statement, related literature and technology reviews as well as possible research contribution in the study area with ethical standards.
Sub PLO 3A level 3:

Develop technical/research proposal and/or research reports in detail including problem statement, related literature and technology reviews as well as possible research contribution in the study area with ethical standards.

Sub PLO 3B level 1:
Review research problems with extensive analysis in oral presentation form with ethical standards.
Sub PLO 3B level 2:
Communicate the knowledge and technologies through technical meetings, and oral presentation with ethical standards.
Sub PLO 3B level 3:
Communicate the knowledge and technologies effectively through technical meetings, and oral presentation with ethical standards.

1.5 Stage Learning Outcomes (Stage LOs)

Stage LO for students in study plans A1 and B1 (already graduated with Master degree)

Stage LO 1: (year 1)

- Obtain existing knowledge and technologies in electrical, electronic, telecommunication, control and/or computer engineering. (PLO1 level 1)
- Analyze and evaluate the knowledge and technologies including advantage and disadvantage of each one. (PLO1 level 2)
- Review of related literature and state-of-art advanced algorithms/approaches. (Sub PLO 3B level 1)
- Review research problems with extensive analysis in both written and oral forms. (Sub PLO 3A level 1, Sub PLO 3B level 1)

In this first year of study, students will take required courses (with or without credits) in the program as well as a self-study to obtain up-to-date existing knowledge and technologies in electrical and computer engineering areas. As a result, students can analyze and evaluate the knowledge and technologies including the advantagees and disadvantages of each one. In addition, each student will spend time preparing for a Qualifying Examination (QE). It is to assess the background knowledge and research skill of students in a specified research area. Essentially, review of the literature and state-of-art advanced algorithms/approaches for related research problems should be covered with extensive analysis. Both written and oral forms are required for this exam. Details of the QE process are discussed later in Section 4, topic 2. At this learning stage, PLO 1 levels 1 and 2, and PLO 3 (with Sub PLO 3A level 1 and Sub PLO 3B level 1) are fulfilled.

Stage LO 2: (year 2)

- Evaluate existing knowledge, technologies and research problems in electrical, electronic, telecommunication, control and/or computer engineering. (PLO 1 level 2)
- Design a research methodology, a procedure for an advanced algorithm or a technique to solve a technical/research problem or an industrial problem. Provide a procedure to

conduct computer simulations or experiments for result evaluation with ethical standards. (PLO 2 level 1, Sub PLO 3A level 2, Sub PLO 3B level 2)

- Apply the obtained knowledge, skill, or advanced algorithm/technique to solve a research problem or an application/industrial problem. (PLO 2 level 1)

In the second/third year, students will choose elective courses and/or self-study based on their research interests. They will spend more time doing research in a specific area to form a research topic and a corresponding dissertation proposal. The **dissertation proposal examination** should be scheduled in the following 1-3 semester(s) after the student passed the QE and has selected a research topic and obtained sufficient research knowledge. The contents of the proposal include an introduction to the research problem, related work, scope of work, research contribution, research methodology, preliminary research result, discussion and validation. Both a written proposal report and an oral exam are required. Details of the proposal exam is discussed later in section 4, topic 2. At this learning stage, students develop their research methodologies with advanced algorithms and techniques. Preliminary research results may be obtained so that they can be published in national/international proceedings of technical conferences. Thus, students achieve PLO 1 level 2, PLO 2 level 1, and PLO 3 (with Sub PLO 3A level 2 and Sub PLO 3B level 2) in this second year of study.

Stage LO 3: (year 3)

- Develop technical/research proposal and research progress reports in detail to improve or invent an advanced algorithm or a technique (innovation) to solve research problem or industrial problem in electrical, electronic, telecommunication, control and/or computer engineering area. (PLO 2 level 2, PLO 3 Sub PLO 3A level 3)
- Applied ethical standards including research ethics and professional ethics. (PLO 3 level 3)
- Communicate the knowledge and technologies effectively through technical meetings, and oral presentation with ethical standards. (PLO 3 Sub PLO 3B level 3)

In the third year of study, students may choose elective courses and/or self-study based on their research interest to complete all required course credits. They will dedicate most of their study time to their research and preparing for paper publication to fulfill the program requirement. The programme recommends each student publish two peer-reviewed international journals or one peer-reviewed international (ISI indexed) journal with two peer-reviewed international conference papers at this time subject to their study plan's requirement. After completion of the dissertation, the student should prepare for the final **dissertation defense examination**. In addition, the student must pass the English proficiency test (TOEFL 550 or equivalent) before taking the final defense examination.

Thus, in this learning stage, students achieve all learning outcomes; PLO1 level 2, PLO 2 level 2 and PLO 3 level 3 (with Sub PLOs 3A level 3 and Sub PLO 3B level 3).

Stage LO for students in study plan B2 (graduated with Bachelor degree)
Stage LO 1: (years 1-2)

In this first year of study for students who have not earned master degree, they will mainly take required courses and may be elective courses. They may have to prepare for the

English proficiency test (TOEFL 550 or equivalent) which is a programme requirement, so that they will have sufficient English communication skills (listening, oral and written forms). At this learning stage, students achieve PLO 1 levels 1 and 2, and PLO 3 with Sub PLO 3A level 1 and Sub PLO 3B level 1).

Stage LO 2: (year 3)

Same as Stage LO 2: (year 2) of Plans A1 and B1

Students achieve PLO 1 level 2, PLO 2 level 1, and PLO 3 with Sub PLO (3A level 2 and 3B level 2) in this third year of study.

Stage LO 3: (year 4)

Same as Stage LO 3: (year 3) of Plans A1 and B1

Students achieve all learning outcomes; PLO1 level 2, PLO 2 level 2 and PLO 3 level 3 (with SubPLOs 3A level 3 and 3B level 3).

The stage learning outcomes for all program plans can be summarized and presented as follows.

SLO 1 = PLO 1 Level 1 + PLO 1 Level 2 + PLO 3 Level 1 + PLO 3B Level 1

SLO 2 = PLO 1 Level 2 + PLO 2 Level 1 + PLO 3A Level 2 + PLO 3B Level 2

SLO 3 = PLO 1 Level 2 + PLO 2 Level 2 + PLO 3A Level 3 + PLO 3B Level 3

2. Programme Development Plan

Improvement/Modification Plan	Strategy	Evidence/Indicator
• Obtain feedback from students in each semester based on the study programme, service and facility	• To improve the study programme, service and facility for all students	• Analysis report on study feedback
• Provide tutoring classes for TOEFL exam preparation	• To help students improve their English language proficiency which is a requirement of the programme	• Schedule for TOEFL tutoring classes
• Adapt the curriculum to meet the standards governed by OHEC (Office of the Higher Education Commission)	• Study OHEC standards	• New versions of curriculum documents • Report of curriculum evaluation
• Adapt the curriculum to meet the 13th national economic and social development plan (2022 - 2026)	• Study aims and objectives of the 13th national economic and social development plan (2022 - 2026)	• Collect comments from Programme Committees • Number of research staffs • Number of staffs who can produce creative media

Improvement/Modification Plan	Strategy	Evidence/Indicator
• Encourage teaching faculty and student to gain research and technology development experiences to be competitive in this fast-changing technological society.	• Develop staffs to gain skills in modern teaching tools • Encourage staffs to produce more research outputs and outcomes • Encourage staffs to create researches from industrial collaboration	• Number of research publication • Number of international conference papers • Number of international journals
• Evaluate and update curriculum to comply with policy and guidelines from the ministry of education. • Comply with the Regulations of the King Mongkut's University of Technology Thonburi on Graduate Studies 2562 B.E. (2019)	• Form a committee to evaluate the curriculum • design the curriculum to comply with the regulations of the ministry of education (B.E. 2558) and the regulations of King Mongkut's University of Technology Thonburi on Graduate Studies 2562 B.E. (2019) • Revise the curriculum every 5 years for up-to-date curriculum considering the current situation	• The curriculum is complied with the regulations of the ministry of education (2558 B.E.) and the regulations of King Mongkut's University of Technology Thonburi on Graduate Studies 2562 B.E. (2019)

Section 3 Educational Management System, Programme Implementation and Structure

1. Educational Management System

1.1 System

A bi-semester system is used where one academic year is divided into two regular semesters and one regular semester has a duration of not less than 15 weeks.

1.2 Summer (special) Semester

A Summer semester (at least 8 weeks) is offered per year only for research courses while no lecture courses (both core courses and elective courses) are offered.

1.3 Credit Equivalence Ratio (In Reference to Semester System)

N/A

2. Programme Implementation

2.1 Academic Calendar

Class time is regularly scheduled at 9.00-16.30 hr. on working days and optionally at 18.00 - 21.00 hr. for a few classes that are jointed with Master programme classes. However, at normal conditions without a Covid-19 pandemic, each research laboratory is opened at all time with laboratory's key card; 24 hours a day and 7 days a week. To save utility and facility costs, we do not allow students to stay overnight at the research lab. They have to turn off the air condition and light when leaving the room. All other electronic equipment should be turned off, when not in use.

Semester 1:	August- Middle of December
Semester 2:	January-Middle of May
Semester 3 (Summer):	June-August

2.2 Admission Requirements

Students' intake is managed by the admission committee consisting of at least two faculty members from the computer engineering department, electrical engineering department, electronic and telecommunication engineering department and/or control engineering department. Each applicant is screened and accepted based on the criteria specified by the University and the Faculty of Engineering. The requirements for applicants are as follow.

1) Background degree: Master degrees or Bachelor degrees with first-class honor or second-class honor in computer engineering, computer science, applied science, electrical engineering, or equivalent. Applicants are required to have a GPA of at least 3.25 out of 4.00 or else have published research paper(s) in the study area. An applicant with a degree in related fields is subject to approval from the admission committee.

2) Qualification for the non-coursework plan: applicants must have a strong background in researching with at least two paper publications, or else have completed Ph.D. coursework from an academic institution.

3) English proficiency: pass the KMUTT language requirement for Ph.D. students who apply to the program in 2022 or later. The requirement is to pass TETET 5.0 or equivalent, as shown in the following table. Other students are required to take LNG 601 which is an English course as a prerequisite.

4) Two letters of recommendation.

* The KMUTT language requirement may be subject to changes based on the latest KMUTT announcement.

English test and equivalent scores

English Test	**Equivalent Score**
ITP TOEFL	500
TOEFL PBT (Paper-based Test)	500
TOEFL iBT (Internet-based Test)	72
IELTS	5.5
TETET	5.0

2.3 Problems of Incoming Students and 2.4 Strategies for Solving the Problems/ Constraints of Students in Item 2.3

Problems of Incoming Students	Problem Solving Strategies
1) Some students have insufficient English language proficiency.	- Provide English language classes for technical writing and TOEFL preparation. - Evaluate students' English proficiency in every main semester
2) Some students do not have a strong background in mathematics and engineering skills.	- Enforce students to take prerequisite courses if needed at the beginning of their study period.
3) Some students do not have enough concentration and afford in conducting research.	- Assign a provisional advisor who is in charge of new students until they find their research advisors.
4) Some students have financial problems.	- Provide partial research funding.

2.5 A Five-year Plan for Admission and Graduation

Number of students	Number of students in each academic year				
	2022	2023	2024	2025	2026
Plan A1: Applicants who have Master degree					
Year 1	2	2	2	2	2
Year 2	-	2	2	2	2
Year 3	-	-	2	2	2
Year 4	-	-	-	2	2
Plan B1: Applicants who have Master degree					
Year 1	5	5	5	5	5
Year 2	-	5	5	5	5
Year 3	-	-	5	5	5
Year 4	-	-	-	5	5
Plan B2: Applicants who have Bachelor degree					
Year 1	3	3	3	3	3
Year 2	-	3	3	3	3
Year 3	-	-	3	3	3
Year 4	-	-	-	3	3
Total	-	-	-	-	3
Overall incoming students	10	20	30	40	50
Expected number of graduates	3	6	6	9	11

Note: Plan to accept new students is the same as in the revised curriculum 2017

2.6 Planned Budget (Baht)

Student Payment (Baht)	Per semester	Per year
1. Tuition Fee	28,000	56,000
2. Credit Fee (2000 Baht/ credit)		
Plan A1 No-course work	1,000	2,000
Plan B1 Course work (12 credits)	4,000	8,000
Plan B2 Course work (27 credits)	6,000	12,000
3. Research Credit (2,000 Baht/ credit)		
Plan A1 No-course work (48 research credits)	20,000	40,000
Plan B1 Course work (36 research credits)	16,000	32,000
Plan B2 Course work (48 research credits)	15,000	30,000
Average student payment for each year (per person)		
Plan A1	90,000	
Plan B1	88,000	
Plan B2	93,500	
Average student payment for each plan (per person)		
Plan A1	270,000	
Plan B1	264,000	
Plan B2	374,000	

2.6.1 Revenue Budget (Baht)

Revenue Budget	Budget year				
	2022	2023	2024	2025	2026
Plan A1: Applicants who have Master degree					
Tuition fee	336,000	336,000	336,000	336,000	336,000
Credit fee	192,000	192,000	192,000	192,000	192,000
Research project	100,000	100,000	100,000	100,000	100,000
Government funding	300,000	294,000	288,120	282,358	276,710
Total	928,000	922,000	916,120	910,358	904,710
Plan B1: Applicants who have Master degree					
Tuition fee	616,000	784,000	840,000	840,000	840,000
Credit fee	352,000	448,000	480,000	480,000	480,000
Research project	350,000	350,000	350,000	350,000	350,000
Government funding	550,000	686,000	720,300	705,894	691,776
Total	1,868,000	2,268,000	2,390,300	2,375,894	2,361,776
Plan B2: Applicants who have Bachelor degree					
Tuition fee	224,000	392,000	504,000	672,000	672,000
Credit fee	150,000	262,500	337,500	450,000	450,000
Research project	50,000	50,000	50,000	50,000	50,000
Government funding	200,000	343,000	432,180	564,715	553,421
Total	624,000	1,047,500	1,323,680	1,736,715	1,725,421
All plans					
Tuition fee	1,176,000	1,512,000	1,680,000	1,848,000	1,848,000
Credit fee	694,000	902,500	1,009,500	1,122,000	1,122,000
Research project	500,000	500,000	500,000	500,000	500,000
Government funding	1,050,000	1,323,000	1,440,600	1,552,967	1,521,907
Total	**3,420,000**	**4,237,500**	**4,630,100**	**5,022,967**	**4,991,907**

2.6.2 Expenditure (Baht)

	Budget year (Baht)				
	2022	**2023**	**2024**	**2025**	**2026**
1. Personal Expenditure	**3,314,304**	**3,413,733**	**3,516,145**	**3,621,629**	**3,730,278**
Salary	2,959,200	3,047,976	3,139,415	3,233,598	3,330,606
Welfare Benefit 26 %	355,104	365,757	376,730	388,032	399,673
2. Administrative Expenditure	568,438	638,791	672,676	706,582	704,097
2.1 Remuneration	202,500	202,500	202,500	202,500	202,500
2.2 Ordinary expenses	42,000	54,000	60,000	66,000	66,000
2.3 Materials	42,000	54,000	60,000	66,000	66,000
2.4 Utility costs	42,000	54,000	60,000	66,000	66,000
2.5 Scholarships	75,000	75,000	75,000	75,000	75,000
2.6 Other expenses	164,938	199,291	215,176	231,082	228,597
3. University expenses	**1,358,280**	**1,746,360**	**1,940,400**	**2,134,440**	**2,134,440**
3.1 From tuition fee	623,280	801,360	890,400	979,440	979,440
3.2 From government funding	735,000	945,000	1,050,000	1,155,000	1,155,000
4. Faculty management expense	**75,000**	**75,000**	**75,000**	**75,000**	**75,000**
Equipment	75,000	75,000	75,000	75,000	75,000
Total	5,316,022	5,873,884	6,204,221	6,537,652	6,643,816
Expense per student	253,144	217,551	206,807	198,111	201,328
Average expense per student	215,388				

Note: Tuition rate may change with the university regulation. Students may also receive scholarships from various funding sources.

2.7 Academic System

Academic year, in class rooms and/or via electronic communication.

2.8 Credit Transfer Cross-institutional Enrollment

A student may transfer and register across academic institutions based on the university regulation (Appendix F) which be subject to changes based on the KMUTT latest announcement.

3 Programme and Lecturers

3.1 Programme

3.1.1 Total required credits in the programme

Plan A1: 48 credits for students with master degree, without coursework
Plan B1: 48 credits for students with master degree, with course work
Plan B2: 75 credits for students without master degree (with bachelor degree), with course work

3.1.2 Programme Structure

Plan A1: without course work

Core Course	0	credits (S/U)
Elective Course	0	credits
Dissertation Credit	48	credits
Total	48	credits

Plan B: with course work

Plan B1:

Core Course	6	credits
Elective Course	6	credits
Dissertation Credit	36	credits
Total	48	credits

Plan B2:

Core Course	6	credits
Elective Course	21	credits
Dissertation Credit	48	credits
Total	75	credits

3.1.3 Course list: consisting of required courses and special topic courses

Subject codes are arranged by departments, such that

CPE = Courses in Computer Engineering
EEE = Courses in Electrical Engineering
ENE = Courses in Electronic and Telecommunication Engineering
INC = Courses in Control Systems and Instrumentation Engineering

Course code meaning for CPE

6xx-7xx = Courses in the graduate level
710-711 = Core courses of the curriculum
691 = Core courses of the curriculum
600-601 = Courses in the area of fundamental computer engineering
610-614 = Courses in the area of applied mathematics
620-625 = Courses in the area of data science
630-633 = Courses in the area of graphics, image processing, and user interface
640-643= Courses in the area of cognitive computing
650-655 = Courses in the area of software, systems, and security
701 = Dissertation

Course code meaning for CPE/EEE/ENE/INC

795-798 = Courses in the area of special topics
L = Lecture
P = Practice
S = Self-study

Core Courses (6 credits)

Code	Title	(L-P-S)
CPE 691	Research Methodology ระเบียบวิธีวิจัย	2 (2-0-6)
CPE 710	Independent Study การศึกษาแบบอิสระ	3 (0-0-12)
CPE 711	Electrical and Computer Engineering Seminar สัมมนาเชิงวิศวกรรมไฟฟ้าและคอมพิวเตอร์	1 (2-0-3)

Remark:

Plan A1 Select CPE 691 (S/U) and CPE 711 (S/U)
Plan B1 Select 6 credits from CPE 691, CPE 710 and CPE 711 as core courses
Plan B2 Select 6 credits from CPE 691, CPE 710 and CPE 711 as core courses

Elective Courses

Code	Title	(L-P-S)
CPE 600	Technical Research Writing หลักการเขียนเอกสารวิจัยเชิงเทคนิค	3 (3-0-9)
CPE 610	Algorithm Analysis and Design การวิเคราะห์อัลกอริทึมและการออกแบบ	3 (3-0-9)
CPE 611	Queuing Theory ทฤษฎีแถวคอย	3 (3-0-9)
CPE 612	Game Theory ทฤษฎีเกม	3 (3-0-9)
CPE 613	Optimization Methods วิธีการหาค่าที่เหมาะที่สุด	3 (3-0-9)
CPE 614	Applied Discrete Mathematics คณิตศาสตร์แบบไม่ต่อเนื่องเชิงประยุกต์	3 (3-0-9)
CPE 615	Experimental Design and Data Analysis การออกแบบการทดลองและการวิเคราะห์ข้อมูล	3 (3-0-9)
CPE 620	Data Mining	3 (3-0-9)

	การทำเหมืองข้อมูล	
CPE 623	Text Mining and Social Network Analysis การทำเหมืองข้อความและการวิเคราะห์เครือข่ายทางสังคม	3 (3-0-9)
CPE 621	Data Visualization การสร้างภาพข้อมูล	1 (1-0-3)
CPE 622	Data Science for Business วิทยาศาสตร์ข้อมูลสำหรับธุรกิจ	2 (2-0-6)
CPE 624	Big Data การจัดการกับข้อมูลขนาดใหญ่	3 (3-0-9)
CPE 625	High Performance and Cloud Computing การประมวลผลด้วยคอมพิวเตอร์ สมรรถนะสูงและคลาวด์	3 (3-0-9)
CPE 630	Computer-Aided Geometric Design คอมพิวเตอร์ช่วยเหลือเพื่อการออกแบบเรขภาพ	3 (3-0-9)
CPE 631	Advanced Geometric Modeling การจำลองแบบเรขภาพขั้นสูง	3 (3-0-9)
CPE 632	Human Computer Interaction การปฏิสัมพันธ์ระหว่างมนุษย์และคอมพิวเตอร์	3 (3-0-9)
CPE 633	Digital Watermarking for Multimedia Content การทำลายน้ำดิจิทัลสำหรับเนื้อหาสื่อประสม	3 (3-0-9)
CPE 634	Digital Educational Game Design การออกแบบเกมดิจิทัลเพื่อการศึกษา	3 (3-0-9)
CPE 640	Artificial Intelligence ปัญญาประดิษฐ์	3 (3-0-9)
CPE 641	Natural Language Processing การประมวลผลภาษาธรรมชาติ	3 (3-0-9)
CPE 642	Speech Processing การประมวลผลเสียงพูด	3 (3-0-9)
CPE 643	Applied Machine Learning การเรียนรู้ของเครื่องแบบประยุกต์	3 (3-0-9)
CPE 650	Software Engineering วิศวกรรมซอฟต์แวร์	3 (3-0-9)
CPE 651	Multimedia Information Retrieval การค้นคืนข้อมูลสื่อประสม	3 (3-0-9)
CPE 652	Bio-inspired Computing การคำนวณที่ได้แรงบันดาลใจจากสิ่งมีชีวิตในธรรมชาติ	3 (3-0-9)

CPE 653	Digital Image Processing and Analysis การประมวลผลภาพดิจิทัลและการวิเคราะห์	3 (3-0-9)
CPE 654	Brain-Computer Interface การประสานกันของสมองกับคอมพิวเตอร์	3 (3-0-9)
CPE 655	Data Security for Multimedia Communications ความมั่นคงของข้อมูลสำหรับการสื่อสารสื่อประสม	3 (3-0-9)
CPE 795	Special Topic (หัวข้อพิเศษ)	3 (3-0-9)
EEE 795	Special Topic (หัวข้อพิเศษ)	3 (3-0-9)
ENE 795	Special Topic (หัวข้อพิเศษ)	3 (3-0-9)
INC 795	Special Topic (หัวข้อพิเศษ)	3 (3-0-9)

These elective courses are graduate courses offered by the four departments which are Computer Engineering, Electrical Engineering, Electronics and Telecommunication Engineering, and Control System and Instrumentation Engineering.

A. Dissertation (48/60)

Code	**Title**	**(L-P-S)**
CPE 790	Dissertation (Plan B1) วิทยานิพนธ์ (แผน B1)	36 (0-0-144)
CPE 791	Dissertation (Plan A1 and Plan B2) วิทยานิพนธ์ (แผน A1 และ B2)	48 (0-0-192)

3.1.4 Study Plan

Plan A1: Students in this plan are required to take CPE 691 Research Methodology and CPE 711 Electrical and Computer Engineering Seminar without credit (S/U)

Year 1 Semester 1	
CPE 691 Research Methodology	2 (2-0-6) (S/U)
Total	2 (2-0-6)
Hour/Week	= 8
Year 1 Semester 2	
CPE 711 Electrical and Computer Engineering Seminar	1 (2-0-3) (S/U)
CPE 791 Dissertation	8 (0-0-32)
Total	9 (2-0-35)
Hour/Week	= 37
Year 2 Semester 1	
CPE 791 Dissertation	10 (0-0-40)
Total	10 (0-0-40)
Hour/Week	= 40
Dissertation Proposal is recommended	
Year 2 Semester 2	
CPE 791 Dissertation	10 (0-0-40)
Total	10 (0-0-40)
Hour/Week	= 40
Year 3 Semester 1	
CPE 791 Dissertation	10 (0-0-40)
Total	10 (0-0-40)
Hour/Week	= 40
Year 3 Semester 2	
CPE 791 Dissertation	10 (0-0-40)
Total	10 (0-0-40)
Hour/Week	= 40

Students in this study plan A1 must pass the Qualifying Examination within the first three semesters (year 2, term 1), before dissertation credit(s) can be registered. Then the Dissertation Proposal can be obtained in the following semester, after the QE is passed.

Plan B1: With course work

Year 1 Semester 1

CPE 691 Research Methodology	2 (2-0-6)
CPE 710 Independent Study	3 (0-0-12)
Total	5 (2-0-18)
Hour/Week	= 20

Year 1 Semester 2

CPE 711 Electrical and Computer Engineering Seminar	1 (2-0-3)
CPE/EEE/ENE/INC 795 Elective	3 (3-0-9)
CPE/EEE/ENE/INC 795 Elective	3 (3-0-9)
CPE 790 Dissertation	2 (0-0-8)
Total	9 (8-0-29)
Hour/Week	= 37

Year 2 Semester 1

CPE 790 Dissertation	9 (0-0-36)
Total	9 (0-0-36)
Hour/Week	= 36

Dissertation Proposal is recommended

Year 2 Semester 2

CPE 790 Dissertation	9 (0-0-36)
Total	9 (0-0-36)
Hour/Week	= 36

Year 3 Semester 1

CPE 790 Dissertation	8 (0-0-32)
Total	8 (0-0-32)
Hour/Week	= 32

Year 3 Semester 2

CPE 790 Dissertation	8 (0-0-32)
Total	8 (0-0-32)
Hour/Week	= 32

Students in this study plan B1 must pass the Qualifying Examination within the first three semesters (year 2, term 1), before dissertation credit(s) can be registered. Then the Dissertation Proposal can be obtained in the following semester, after the QE is passed.

Plan B2: With course work

Year 1 Semester 1	
CPE/EEE/ENE/INC 795 Elective	3 (3-0-9)
CPE/EEE/ENE/INC 795 Elective	3 (3-0-9)
CPE/EEE/ENE/INC 795 Elective	3 (3-0-9)
Total	9 (9-0-27)
Hour/Week	= 36
Year 1 Semester 2	
CPE/EEE/ENE/INC 795 Elective	3 (3-0-9)
CPE/EEE/ENE/INC 795 Elective	3 (3-0-9)
CPE/EEE/ENE/INC 795 Elective	3 (3-0-9)
Total	9 (9-0-27)
Hour/Week	= 36
Year 2 Semester 1	
CPE 691 Research Methodology	2 (2-0-6)
CPE 710 Independent Study	3 (0-0-12)
CPE/EEE/ENE/INC 795 Elective	3 (3-0-9)
CPE 791 Dissertation	2 (0-0-8)
Total	10 (5-0-35)
Hour/Week	= 40
Year 2 Semester 2	
CPE 711 Electrical and Computer Engineering Seminar	1 (2-0-3)
CPE 791 Dissertation	9 (0-0-36)
Total	10 (2-0-39)
Hour/Week	= 41
Year 3 Semester 1	
CPE 791 Dissertation	10 (0-0-40)
Total	10 (0-0-40)
Hour/Week	= 40
Dissertation Proposal is recommended	
Year 3 Semester 2	
CPE 791 Dissertation	9 (0-0-36)
Total	9 (0-0-36)
Hour/Week	= 36
Year 4 Semester 1	
CPE 791 Dissertation	9 (0-0-36)
Total	9 (0-0-36)
Hour/Week	= 36

Year 4 Semester 2

CPE 791 Dissertation	9 (0-0-36)
Total	9 (0-0-36)
Hour/Week	= 36

Students in this study plan B2 must pass the Qualifying Examination within the first four semesters (year 2, term 2), before dissertation credit(s) can be registered. Then the Dissertation Proposal can be obtained in the following semester, after the QE is passed.

3.2 Name, Surname, Academic Position, Qualifications of Lecturers

3.2.1 The Programme Lecturers in-Charge

No.	Name-Surname	Teaching loads (hours/week/academic year)	
		Present	When the program started
1	Assoc. Prof. Dr. Naruemon Wattanapongsakorn	6	6
2	Asst. Prof. Dr. Sumate Naetiladdanon	6	6
3	Asst. Prof. Dr. Werapon Chiracharit	6	6
4	Dr. Tanagorn Jennawasin	6	6
5	Prof. Dr. Booncharoen Sirinaovakul	6	6
6	Prof. Dr. Kosin Chamnongthai	6	6
7	Assoc. Prof. Dr. Thumrongrat Amornraksa	6	6
8	Assoc. Prof. Dr. Peerapon Siripongwutikorn	6	6
9	Assoc. Prof. Natasha Dejdumrong	6	6
10	Asst. Prof. Dr. Jumpol Polvichai	6	6
11	Asst. Prof. Dr. Nuttanart Facundes	3	3
12	Asst. Prof. Santitham Prom-on	3	3
13	Asst. Prof. Dr. Suthathip Maneewongvatana	3	3
14	Asst. Prof. Dr. Phond Phunchongharn	3	3
15	Asst. Prof. Dr. Khajornpong Akkarajitsakul	3	3
16	Asst. Prof. Dr. Priyakorn Pusawiro	3	3
17	Dr. Jaturon Harnsomburana	3	3
18	Dr. Unchalisa Taetragool	3	3
19	Dr. Kharittha Jangsamsi	3	3
20	Dr. Prapong Prechaprapranwong	3	3
21	Dr. Tassaneewan Laksanasopin	3	3
22	Asst. Prof. Dr. Sutatch Ratanaphan	3	3
23	Assoc. Prof. Dr. Orawan Duangphakdee	3	3

No.	Name-Surname	Teaching loads (hours/week/academic year)	
		Present	When the program started
24	Assoc. Prof. Dr. Boonserm Kaewkamnerdpong	3	3
25	Assoc. Prof. Dr. Wudhichai Assawinchaichote	6	6
26	Assoc. Prof. Dr. Raungrong Suleesathira	6	6
27	Assoc. Prof. Dr. Wuttipong Kumwilaisak	6	6
28	Assoc. Prof. Dr. Rardchawadee Silapunt	6	6
29	Asst. Prof. Dr. Suwat Pattaramalai	6	6
30	Asst. Prof. Dr. Pinit Kumhom	3	3
31	Asst. Prof. Dr. Chirasil Chayawan	3	3
32	Asst. Prof. Dr. Kamon Jirasereeamornkul	3	3
33	Asst. Prof. Dr. Apichai Bhatranand	3	3
34	Asst. Prof. Dr. Yuttapong Jiraraksopakun	3	3
35	Asst. Prof. Dr. Watcharapan Suwansantisuk	3	3
36	Assoc. Prof. Dr. Mongkol Konghirun	6	6
37	Asst. Prof. Dr. Anawach Sangswang	6	6
38	Asst. Prof. Dr. Supakit Chotigo	6	6
39	Asst. Prof. Dr. Ekkachai Mujjalinvimut	3	3
40	Dr. Piyasawat Navaratana Na Ayudhya	3	3
41	Assoc.Prof. Dr. Poj Tangamchit	3	3
42	Assoc. Prof. Dr. Benjamas Panomruttanarug	6	6
43	Assoc.Prof. Dr. Wanchak Lenwari	3	3
44	Asst. Prof. Dr. Sudchai Boonto	3	3
45	Asst. Prof. Dr. Diew Koolpiruck	3	3
46	Asst. Prof. Dr. Panuthat Boonpramuk	3	3
47	Asst. Prof. Dr. Sarawan Wongsa	3	3
48	Asst. Prof. Dr. Santi Nuratch	3	3
49	Dr. Issarapong Khuankrue	3	3
50	Dr. Chanchai Techawatcharapaikul	3	3
51	Dr. Supapong Nutwong	3	3

3.2.2 Full-time lecturers

No.	Name-Surname	Educational qualification (field of study), institution of graduation, country of graduation (year of graduation)	Teaching Loads in this course (hours/week/ academic year)	
			Present	When the program started
1	Asst.Prof. Dr. Punchalee Samanpiboon	-Ph.D. (Systems Engineering), Nippon Institute of Technology, Japan (2005) -M.Eng. (Systems Engineering), Nippon Institute of Technology, Japan (2002) -B.Eng (Control System and Instrumentation Engineering) King Mongkut's University of Technology Thonburi, Thailand (2541)	3	3
2	Asst.Prof. Dr. Thorin Theeradejvanichkul	- Ph.D. (Electrical and Computer Engineering), University of Wisconsin-Madison, U.S.A. (2008) - M.S. (Electrical and Computer Engineering), University of Wisconsin-Madison, U.S.A. (2000) - B.S. (Electrical Engineering and Materials Sciences Engineering), University of California at Berkeley, U.S.A. (1998)	3	3
3	Dr. Paisarn Sonthikorn	-Ph.D. (Electrical and Computer Engineering), Carnegie Mellon University, U.S.A. (2009) -M.Eng. (Electrical Engineering and Computer Science), Massachusetts Institute of Technology, U.S.A (2002) -B.S. (Electrical Engineering and Computer Science), Massachusetts Institute of Technology, U.S.A (2001)	3	3
4	Dr. Tanapat Deesuwan	-Ph.D. (Physic), Imperial College London, U.K. (2016) -M.Res. (Controlled Quantum Dynamics), Imperial College London, U.K. (2011) -M.Sc. (Quantum Fields and Fundamental Forces), Imperial College London, U.K. (2010) -B.S. (Physics), Mahidol University, Thailand (2551)	3	3

3.2.3 Guest Lecturers

None

4 Field Experience Requirement (Internship or Co-Op)

None

5 Requirements for Project or Research Work

5.1 Brief Description

The students must pass 3 examinations, known respectively as qualifying examination, proposal examination, and final dissertation defense. The students in plan A1 and plan B1 must take a qualifying examination no later than the second semester in residence. The students in plan B2 must take a qualifying examination no later than the fourth semester in residence. The students must submit a progress report to the committee every semester while taking research credits. The students can take a dissertation defense after completing all publication requirements and English proficiency requirement.

5.2 Research Learning Outcomes

1) The students are capable of learning and evaluating new knowledge/technologies.
2) The students are capable of applying technology to improve system efficiency.
3) The students are capable of developing research for a new and advanced technology.
4) The students are capable of transferring/presenting knowledge/technology effectively to both academic and non-academic audiences.
5) The students are capable of publishing their research works in high-standard international journals complied with the university requirement.
6) Students are aware of both research ethics and professional ethics, and able to apply them appropriately.

5.3 Duration

Since year-1, semester-1	for students in plan A1
Since year-1, semester-2	for students in plan B1
Since year-2, semester-2	for students in plan B2

5.4 Total Required Credits

48 dissertation credits for students in plan A1
36 dissertation credits for students in plan B1
48 dissertation credits for students in plan B2

5.5 Preparation Plan

Student orientations are provided by the university and the department for new students at the beginning of the academic term. Advising hours for each faculty advisor are scheduled. The necessary information of research activities is announced/provided to all students. Research rooms are available for students under faculty advisors' supervision.

5.6 Assessment Process

The student conducts research under the guidance of the faculty advisor to produce research outputs such as presentations, publications or patents. To evaluate a student's research progression, the progress report is submitted to the dissertation committee at the end of each semester when the student register for dissertation credit(s). The committee is composed of a faculty advisor, other faculty members and external committee. The official milestones in the programme are a qualifying examination, a proposal examination and a final dissertation defense examination. For each of these examinations, the student is required to submit a report at least 3 weeks in advance to the department before the examination can be arranged.

Section 4 Programme Learning Outcomes, Teaching and Learning Approaches, and Assessment Methods

1. Development of Student Characteristics

For coursework, class projects and seminar style teaching are extensively used in addition to class lectures. Class projects enable students to independently acquire necessary knowledge and information from appropriate sources and provide chances for students to communicate in English through written reports and oral presentations.

Each regular semester consists of 15 weeks of lecture and 2 weeks of examination. The courses in each module are structured in a relevant manner. All modules form an integrated framework that provides with adequate breadth and depth levels in learning. Each student can freely choose the courses from various modules as desired. The delivery of content in most classes is via multimedia facilities such as LEB2 provided by KMUTT, Google Classroom, Facebook and YouTube. The student shows knowledge gained, according to the course description, through class discussion and presentation, assignments, homeworks, group projects and individual examinations.

For research, students have to spend time consulting with research advisors and perform their research in their areas of interest. Research information including paper publication, products and patents can be accessed online publicly or else from KMUTT subscribed online databases such as IEEE, SCOPUS, Web of Knowledge, Springer, Dissertation Online, etc. The dissertation allows students to develop advanced research skills. There are research steps to follow with corresponding assessments starting with the qualifying examination, followed by research proposal examination, research progress examination and final dissertation defense examination. International journal and conference publication requirements enforce students to get familiar with activities in the research community and build networking of people.

Students' Characteristic	Strategy or Activity for Student
Able to perform advanced research	• Provide research funding. • Approve the students' research proposal • Encourage students to go abroad to do research with foreign experts. • Provide support for students to attend international conferences in the research area.
Has good ethical and moral development	• Announce rules and penalties to students who violate the rules such as plagiarism, cheating in an exam, etc. • Organize a training workshop on research ethics and professional ethics for students in the required courses: research methodology and independent study.
Responsible for the assigned task	• Submit all the assignments including homeworks, reports and presentations on time.
Has good skill in problem handling	• By working on the dissertation which is a problem-based topic.
Has good project and time management skills	• Advisors/instructors introduce a plan, process and schedule to handle the project and monitor the students in each stage.
Has life-long learning skill	• Encourage and advice students to stay updated in the research field and always search for new information from many sources.
Able to present and transfer knowledge and technology effectively	• Encourage students to present the research information publicly in national and international communities.
Has good communication skill	• Enforce using English language in all teaching classes as well as in research discussion, presentation and writing. English proficiency test such as TOEFL with 550 scores or other equivalent tests is required before completing the Ph.D. programme.

2. Development of Programme Learning Outcomes

PLO/ Sub PLO	Teaching strategies to develop learning outcome	Assessment of learning outcomes
PLO 1: Evaluate existing knowledge, technologies and research problems in electrical, electronic, telecommunication, control and/or computer engineering.	- Classroom lecture and discussion - Class project, homework and assignments - Enforce study on current and new technology in electrical and/or computer engineering to solve related problems - Advice on a literature review of related knowledge and technology	- Class examination - Evaluation of class project, homework and assignments - Project presentation - Qualifying examination
PLO 2: Achieve new knowledge with research ethics to improve or invent an advanced algorithm or a technique (innovation) to solve a research problem or an industrial problem in electrical, electronic, telecommunication, control and/or computer engineering area.	- Design and develop a problem-solving model using appropriate research methodology - Weekly or bi-weekly research meetings with the research advisor - Paper publication writing workshop	- Dissertation proposal examination - Project/research results and evaluation - Research progress examination - Final dissertation defense examination - Number of paper publications and the quality of the research paper based on publication type and its ranking.
PLO 3: Communicate effectively with ethical standards including research ethics and professional ethics through technical meetings, reports, proposals, and oral presentations.		
Sub PLO 3A: Develop technical/research proposal and/or research reports in detail including problem statement, related literature and technology reviews as well as possible research contribution in the study area with ethical standards.	- Research progress and proposal report writing with regular feedback from the advisor - Technical writing with feedback from the teacher - Professional ethics and research ethics are exercised and enforced in the research/technical writing - A proposal/progress exam committee with 3-5 professors is formed to advise and assess the research proposal/progress.	- Technical/research report in class - Qualifying examination - Dissertation proposal examination - Research progress examination - Final dissertation defense examination
Sub PLO 3B: Communicate the knowledge and technologies effectively through technical meetings, and oral presentation with ethical standards.	- Weekly or bi-weekly research meeting discussion and presentation with the research advisor. - Slide presentation design with good visual aids and infographics for effective communication. - Effective oral presentation/communication with ethical standards.	- Technical/research presentation in class - Qualifying examination - Dissertation proposal examination - Research progress examination - Final dissertation defense examination

3. Curriculum Mapping

3.1 Programme Learning Outcome (PLO) Curriculum Mapping

Courses	PLO1: Evaluate existing knowledge, technologies and research problems in electrical, electronic, telecommunication, control and/or computer engineering.	PLO 2: Achieve new knowledge with research ethics to improve or invent an advanced algorithm or a technique (innovation) to solve a research problem or an industrial problem in electrical, electronic, telecommunication, control and/or computer engineering area.	PLO 3: Communicate effectively with ethical standards including research ethics and professional ethics through technical meetings, reports, proposals, and oral presentations.	
			Sub PLO 3A	Sub PLO 3B
Core Courses				
CPE 691 Research Methodology	1		1	1
CPE 710 Independent Study	2		1	1
CPE 711 Electrical and Computer Engineering Seminar	2		1	1
CPE 790 Dissertation (36 credits)	2	1, 2	1, 2, 3	1, 2, 3
CPE 791 Dissertation (48 credits)	2	1, 2	1, 2, 3	1, 2, 3
Elective Courses				
CPE 600 Technical Research Writing	1		1	1
CPE 610 Algorithm Analysis and Design	2		1	1

Courses	PLO1: Evaluate existing knowledge, technologies and research problems in electrical, electronic, telecommunication, control and/or computer engineering.	PLO 2: Achieve new knowledge with research ethics to improve or invent an advanced algorithm or a technique (innovation) to solve a research problem or an industrial problem in electrical, electronic, telecommunication, control and/or computer engineering area.	PLO 3: Communicate effectively with ethical standards including research ethics and professional ethics through technical meetings, reports, proposals, and oral presentations.	
			Sub PLO 3A	Sub PLO 3B
CPE 611 Queueing Theory	2		1	1
CPE 612 Game Theory	2		1	1
CPE 613 Optimization Methods	2		1	1
CPE 614 Applied Discrete Mathematics	1		1	1
CPE 615 Experimental Design and Data Analysis	2		1	1
CPE 620 Data Mining	2		1	1
CPE 621 Data Visualization	2		1	1
CPE 622 Data Science for Business	2		1	1
CPE 623 Text Mining and Social Network Analysis	2		1	1
CPE 624 Big Data	2		1	1

Courses	PLO1: Evaluate existing knowledge, technologies and research problems in electrical, electronic, telecommunication, control and/or computer engineering.	PLO 2: Achieve new knowledge with research ethics to improve or invent an advanced algorithm or a technique (innovation) to solve a research problem or an industrial problem in electrical, electronic, telecommunication, control and/or computer engineering area.	PLO 3: Communicate effectively with ethical standards including research ethics and professional ethics through technical meetings, reports, proposals, and oral presentations.	
			Sub PLO 3A	Sub PLO 3B
CPE 625 High Performance and Cloud Computing	2		1	1
CPE 630 Computer Aided Geometric Design	2		1	1
CPE 631 Advanced Geometric Modeling	2		1	1
CPE 632 Human Computer Interaction	1		1	1
CPE 633 Digital Watermarking for Multimedia Content	2		1	1
CPE 640 Artificial Intelligence	2		1	1
CPE 634 Digital Educational Game Design	1		1	1
CPE 641 Natural Language Processing	2		1	1
CPE 642 Speech Processing	2		1	1
CPE 643 Applied Machine Learning	2		1	1

Courses	PLO1: Evaluate existing knowledge, technologies and research problems in electrical, electronic, telecommunication, control and/or computer engineering.	PLO 2: Achieve new knowledge with research ethics to improve or invent an advanced algorithm or a technique (innovation) to solve a research problem or an industrial problem in electrical, electronic, telecommunication, control and/or computer engineering area.	PLO 3: Communicate effectively with ethical standards including research ethics and professional ethics through technical meetings, reports, proposals, and oral presentations.	
			Sub PLO 3A	Sub PLO 3B
CPE 650 Software Engineering	2		1	1
CPE 651 Multimedia Information Retrieval	2		1	1
CPE 652 Bio-inspired Computing	2		1	1
CPE 653 Digital Image Processing and Analysis	2		1	1
CPE 654 Brain-Computer Interface	1		1	1
CPE 655 Data Security for Multimedia Communications	2		1	1
CPE 795 Special Topic	1, 2		1	1
EEE 795 Special Topic	1, 2		1	1
ENE 795 Special Topic	1, 2		1	1
INC 795 Special Topic	1, 2		1	1

Description of Levels of PLOs

PLO 1 level 1:
Obtain existing knowledge and technologies in electrical, electronic, telecommunication, control and/or computer engineering.
PLO1 level 2:
Evaluate existing knowledge, technologies and research problems in the electrical, electronic, telecommunication, control and/or computer engineering.

PLO 2 level 1:
Apply the obtained knowledge, skill, or advanced algorithm/technique to solve a research problem or an application/industrial problem.
PLO 2 level 2:
Achieve new knowledge with research ethics to improve or invent an advanced algorithm or a technique (innovation) to solve a research problem or an industrial problem in the electrical, electronic, telecommunication, control and/or computer engineering area.

Sub PLO 3A level 1:
Review research problems with extensive analysis in written form through technical reports.
Sub PLO 3A level 2:
Develop technical/research proposal and/or research progress including problem statement, related literature and technology reviews as well as possible research contribution in the study area with ethical standards.
Sub PLO 3A level 3:
Develop technical/research proposal and/or research reports in detail including problem statement, related literature and technology reviews as well as possible research contribution in the study area with ethical standards.

Sub PLO 3B level 1:
Review research problems with extensive analysis in oral presentation form with ethical standards.
Sub PLO 3B level 2:
Communicate the knowledge and technologies through technical meetings, and oral presentation with ethical standards.
Sub PLO 3B level 3:
Communicate the knowledge and technologies effectively through technical meetings, and oral presentation with ethical standards.

The table shows the relationship between PLOs and KMUTT Student QF and 5 Domains of TQF

Programme Learning Outcomes		KMUTT Student QF										TQF Learning Outcomes																					
		KMUTT's citizenship			Knowledge	Professional	Thinking skill	Learning skill	Management	Communication	Leadership	1. Ethical and Moral Development					2. Knowledge				3. Cognitive Skills				4. Interpersonal Skills and Responsibility				5. Analytical and Communication Skills, Mathematics and IT Application			
		Responsibility	Adaptability	Humanization								1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
PLO 1	Evaluate existing knowledge, technologies and research problems in electrical, electronic, telecommunication, control and/or computer engineering.	/		/	/	/	/	/	/	/		/	/				/	/			/	/			/	/	/		/	/		
PLO 2	Achieve new knowledge with research ethics to improve or invent an advanced algorithm or a technique (innovation) to solve a research problem or an industrial problem in electrical, electronic, telecommunication, control and/or computer engineering area.	/	/	/	/	/	/	/	/	/	/	/	/	/			/	/	/	/	/	/	/	/	/	/		/	/	/	/	/

Note:

1. Each PLO must be aligned with the TQF in at least the first three domains.
2. The overall PLOs must have all the sub-items in the TQF (five domains).

Programme Learning Outcomes		KMUTT Student QF										TQF Learning Outcomes																					
		KMUTT's citizenship			Knowledge	Professional	Thinking skill	Learning skill	Management	Communication	Leadership	1. Ethical and Moral Development					2. Knowledge				3. Cognitive Skills				4. Interpersonal Skills and Responsibility				5. Analytical and Communication Skills, Mathematics and IT Application			
		Responsibility	Adaptability	Humanization								1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
PLO 3	Communicate effectively with ethical standards including research ethics and professional ethics through technical meetings, reports, proposals, and oral presentations.	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/			/	/					/	/	/	/	/	/	/
PLO 3A	Develop technical/research proposal and/or research reports in detail including problem statement, related literature and technology reviews as well as possible research contribution in the study area with ethical standards.	/	/	/	/	/	/	/	/	/		/	/	/	/		/	/			/	/					/	/	/	/	/	/	/
PLO 3B	Communicate the knowledge and technologies effectively through technical meetings, and oral presentation with ethical standards.	/	/	/	/	/	/	/	/	/	/	/	/	/	/		/	/			/	/					/	/	/	/	/	/	/

TQF Framework

Ethical and Moral Development

1.1. To possess morality and ethics e.g. self-discipline, punctual, social responsibility, respect and conform to the rules of the community

1.2. To analyze and solve problem with fairness, react to difficult situations systematically and reasonably

1.3. To handle moral and ethical complicated issues in career concerned for others

1.4. To encourage others to use moral and ethical principles in diagnosing and dealing with conflict that might affect other people

1.5. To demonstrate leadership and encourage others to behave morally and ethically in workplace and community

Knowledge

2.1. To possess knowledge related to the principle, theories in subject field and able to apply knowledge in works

2.2. To have deep understanding in theory and deliver perceptible and outstanding research work

2.3. To have an ability to develop new knowledge and integrate with the old knowledge to give more usefulness, also realize how researches have an impact on new knowledge

2.4. To have awareness of regulations that might affect on subject filed both in national and international environment including concerned with any change that may cause

Cognitive skills

3.1. To have the ability to apply theory and practical knowledge to handle unexpected situation and seek for new a creative method to solve any problem issues

3.2. To be able to apply knowledge and experience to make decision in a case having no sufficient information

3.3. To be able to synthesize, analyze an output of research work and publication to develop new knowledge and integrate with the old knowledge to seek the best solution

3.4. To be able to plan and manage significant projects or academic projects with theoretical and practical knowledge in order to give perfect finding, also widen scope of knowledge and give direction for performing in career

Interpersonal skills and responsibility

4.1. To be able to solve complicated academic problem by oneself

4.2. To be able to make decision to operate any tasks, assess and improve oneself effectively

4.3. To be responsible for assigned tasks, work as a team and deal with any conflict and problem in working group

4.4. To demonstrate leadership characteristic in some situation and chance

Analytical thinking, communication skills, and information technology skills

5.1. To have an ability to apply information technology for data gathering and perform the tasks related to Electrical and Computer Engineering profession

5.2. To be able to differentiate and address many kinds of problem issues

5.3. To be able to filter out mathematical and statistical data for investigating problem and finding solution

5.4. To have an ability to communicate effectively with various groups of people, such as people in academic area or common people. Able to make a presentation both in formal and informal form on academic publication, dissertation and technical report

KMUTT Student QF

Desirable Graduate Characteristics of King Mongkut's University of Technology Thonburi

1. Knowledge is having a deep academic knowledge base in a well-studied field of study, and has extensive knowledge of the changes that have taken place and can apply knowledge to professional practice and in living life properly

2. Professional practice skills (Professional Skill) is the ability to bring knowledge into practice. Proficient in using tools professional equipment. Have the ability to apply technology to work. Has the ability to help guide and train others to be able to perform tasks using various equipment.

3. Thinking Skill (Thinking Skill) is creativity. Have a system of thinking that is "reasonable", knows the information processing Brainstorm ideas from different perspectives. Can choose to use the scheme The idea of "diverse used in problem solving and making rational decisions.

4. Learning Skills are known to seek knowledge. See learning as possible anytime, anywhere. This will help develop into a lifelong learner. can learn through a variety of media that are available in a variety of formats Have a good system and method of thinking, able to distinguish and filter the information obtained from learning appropriately, by competence in learning skills.

5. Communication skills (Communication Skill) is the ability to use the Thai language. Good English in listening, speaking, reading and writing, and able to communicate with others properly and appropriately. Ability to convey, present, and have good listening judgment.

6. Management Skills are the ability to set goals, plan and act effectively, subject to resource constraints and on the basis of moral ethics to achieve personal goals, teams, organizations and society can anticipate problems, impacts and related factors. Including having a good attitude and the ability to prepare, prevent and proactively resolve situations or problems.

7. Leadership (Leadership) is having confidence and value in oneself and others. Have a basic understanding of the team's needs and requirements. Able to create a team working atmosphere inspire and encourage the creation of new things. Stay up-to-date with situations, opportunities and challenges and/create a variety of ways to achieve your goals. Have the ability to listen

deeply able to communicate and coordinate to create cooperation in the thinking and action of the team as well as being a role model for good practice.

8. Citizenship KMUTT (KMUTT's citizenship) is to use the University's Core Value as a guideline for practice professionalism and ethics (Professional and Integrity) including adherence to the Code of Conduct.

Section 5 Criteria for Students Assessment and Evaluation

1. Grading Policy/Guidelines

In accordance with the university policy for graduate study 2019 (2562 BE.).

The performance evaluation for each subject uses the letter grades and the points per credit to calculate the grade point average (GPA).

Note: The grading policy can be changed due to the up-to-date reason and suitability and the students must be obliged.

2. Standard Verification Process for Student Achievement

The verification process for student achievement for each subject is explained, for example, the evaluation from the examination score or the assignments. The process might be different for a different subject or different learning standards.

2.1 Student Achievement Standard Verification Process

For each subject, we provide examinations to evaluate the students' achievement both in written and presentation forms. We use projects or assignments to evaluate the students' achievements. In addition, we conduct a survey form with a few questionnaires to get feedback from the students in the programme.

For a dissertation, the student must pass a qualifying examination, a dissertation proposal defense and final dissertation defense examination.

Qualifying examination (QE) is to assess the background knowledge and research skill of students in a specified research area. Essentially, a review of the literature and state-of-art advanced algorithms/approaches for related research problems should be covered with extensive analysis. This exam has the following policies.

- The QE committee consists of four members which are a research advisor and three other committee members, where one of them is pre-selected as a representative of the Ph.D. programme committee. The research advisor and co-advisor (if any) are considered as a single committee.
- The exam is in oral presentation form with a QE report submitted at least 3 weeks to the department before the exam schedule. The report must comply with KMUTT thesis report format. The oral presentation exam is about 30 minutes with 30-minute addition for questions and answers.
- The exam results can be one of these results: pass (without condition), pass with a condition and fail. For the pass with a condition, the student has 30-60 days to revise the QE report to present or get approval from all committee members. For the fail condition, the student must request for the second round of QE in the next semester. Students in study plans A1 and B1 are required to pass the Ph.D. QE within the first 3 semesters before dissertation credits can be registered, while students in study plan B2 are required to pass the QE within the first 4 semesters before dissertation credits can be registered.

Dissertation proposal examination is scheduled in the following semester after the student passed the QE and has selected a research topic and obtained sufficient research knowledge. The contents of the proposal include a problem statement, related work, research objective and scope of work, research contribution, research methodology, preliminary research result, discussion and validation.

- The thesis proposal defense requires a committee of at least 5 faculty members and/or experts under university requirement, consisting of the student's advisor(s), at least one faculty member outside the 4-joined departments (CPE, EE, ENE and INC), at least one faculty member or an expert outside the university, and two faculty members in the 4-joined department.

- The exam is in oral presentation form with a research proposal report submitted at least 3 weeks to the department before the exam schedule. The report must comply with the KMUTT thesis report format. The oral presentation exam is about 30-45 minutes with 30 minutes in addition to questions and answers.

- The exam results can be one of these results: pass (without condition), pass with a condition and fail. For the pass with a condition, the student has 30-60 days to revise the proposal report to present or get an approval from all committee members. For the fail condition, the student must request for the second round of proposal exam in the next semester. If the student fails the proposal exam twice, he/she will be dropped from the programme.

Research progress examination is to evaluate research progress of the student when he/she register for dissertation credits but does not have QE/proposal/final defense exam in that semester. This progress exam is also to assess the number of dissertation credits that the student can earn based on the amount of research conducted throughout the semester. The contents of the report include research problem statement, information of research obtained in this semester with result, analysis and discussion as well as future work. The followings are the corresponding policies.

- The exam requires three committee members consisting of the research advisor and two other members from the proposal exam. If the student has not done with the proposal exam, the two committee members have to be chosen from the 4-joined departments.

- The exam is in oral presentation form with a research progress report submitted at least 2 weeks to the department prior to the exam schedule. The oral presentation exam is about 15-30 minutes with 15-30 minutes in addition for questions and answers.

Final dissertation defense examination: After the student has passed the English proficiency test (TOEFL 550 or equivalent, as shown in the following table) and complete the dissertation with an approval from the research advisor, the student can register to complete the remaining research credit(s) and submit documents for final dissertation defense. The final dissertation report must compile with university thesis report format, and must be submitted to the programme staff (programme coordinator) hosted at the computer engineering department at least 3 weeks prior to the final defense schedule. The followings are the corresponding policies.

English test and equivalent score requirement for graduation

English Test	**Equivalent Score**
ITP TOEFL	550
TOEFL PBT (Paper-based Test)	550
TOEFL CBT (Computer –based Test)	213
IELTS	6.0
CEFR (Cambridge English test)	C1

- The same group of committee from the proposal defense exam will evaluate the dissertation research from oral presentation, dissertation report and research publication result.
- The exam is in oral presentation form with the final defense report submitted at least 3 weeks to the department prior to the exam schedule. The report must be complied with KMUTT thesis report format. The oral presentation exam is about 40-60 minutes with 30-45 minutes in addition for questions and answers.
- The exam results can be one of these results: pass (without condition), pass with condition and fail. For the pass with condition, the student has 30-90 days to revise the proposal report and complete additional research (if any) according to the reviewers' feedback. Then the student must submit and present the research report revision to all committee members for a consensus approval. For the fail condition, the student must request for the second round of the final exam in the following semester. If the student fails the final defense exam twice, he/she will be dropped from the programme.

Maximum number of accumulated dissertation credits that can be earned from the main exams.

Passed examination	**Eligible credits to earn**	**Study plans A1 and B2**	**Study plan B1**
Progress Exam	12 credits	12 credits	12 credits
Proposal Exam	2 out of 3 of total research credits	2/3 of 48 credits = 32 credits	2/3 of 36 credits = 24 credits
Final Defense Exam	all	48 credits	36 credits

Note: the number of earned research credits in a semester cannot exceed the number of registered credits in that semester. The earned credits are evaluated by the examination committee.

2.2 Verification of Learning Outcome Standards After Graduation

The verification of student learning outcomes is focused on the ongoing student achievement and success. The feedback results are used to improve the programme including the programme quality assessment. The collected data are as follows.

1) The average graduation time.
2) The employment condition of the graduates in the aspects as follows: job searching time, performance and confidence evaluation for the new graduate employment of the employer.
3) The survey from the performance evaluation of the employer after working for some periods in that organization by means of interview or questionnaire.
4) Work position and/or the advancement of the graduates' work position.
5) The programme evaluation from the aspects of knowledge readiness that is related to the work as well as to receive the suggestions for the programme improvement.
6) Comments from the external experts, the graduate advisors and the teachers in this programme to the student's readiness for the study, research as well as other learning qualities.
7) Graduates' tangible outcomes such as (1) number of publication in journals and proceedings (2) number of inventions or developed software for commercial (3) number of patents (4) number of social and professional awards (5) number of charity events to society and the nation, and (6) number of volunteer activities for public.

3. Graduation Requirements

The requirement for graduation is in accordance with the university policy for graduate study (2562 B.E.) and the minimum score of 550 from TOEFL (Paper-based) or the English Proficiency test in the announcement from the Computer Engineering Department, King Mongkut's University of Technology Thonburi. In addition, each student is required to have the following paper publication.

Plan A1: Two peer-reviewed international journal papers (full papers) where at least one of them has ISI impact factor.

Plans B1 and B2: Two peer-reviewed international journal papers (full papers) where at least one of them has ISI impact factor **or**

One peer-reviewed international journal paper (full paper) with ISI impact factor and two peer-reviewed international conference papers.

Section 6 Lecturer Profession Development

1. New Lecturers' Orientation

1.1 Provide an orientation for new faculty members to let them have knowledge and understanding of the policies of the institutes, faculties, as well as the programme.

1.2 Encourage new faculty members to increase their professional skill, knowledge and experience to promote continuous teaching and research.

1.3 Support new faculty members for further education, training, academic and professional visits in various organizations, academic conferences both in the country and/or abroad, or sabbatical leave to gain additional experience.

2. Knowledge and Skill Development for Teachers

2.1 Development of teaching and learning management skills assessment and evaluation

2.1.1 Encourage the development of faculty members in teaching skill according to the university's professional standard framework for teaching and learning support so called KMUTT PSF (KMUTT Professional Standards Framework-Learning and Teaching).

2.1.2 Provide a training on teaching methods, instructional design measurement and evaluation according to the guidelines of the outcome-based education (OBE), as well as the use and production of up-to-date teaching materials.

2.1.3 Provide teaching aids such as projectors, connecting cables, wireless display devices, sub-network system, as well as specific teaching programs for research groups.

2.2) Other academic and professional development

2.2.1 Encourage faculty members to gain professional skills, knowledge, experience in their area of interest by providing funding supports for attending training programs, publishing research journals, and participating in international research conferences.

2.2.2 Provide an academic service unit, Innosoft that allows faculty members to take on academic service jobs so that they can gain experiences from real-world problems to benefit their teaching.

2.2.3 Encourage faculty members in participation in academic service activities related to knowledge and moral development.

Section 7 Programme Quality Assurance

1. Standard Control

KMUTT follows the quality assurance system according to the ASEAN University Network - Quality Assurance (AUN-QA) guidelines. Any programme may wish to have quality assurance in accordance with other internationally accepted guidelines (if any) with the details as follows. Assessment at Programme Level is divided into two components.

Component 1 Supervision of Standards – In order to protect consumers, all courses must be supervised to ensure compliance with Component 1 (Programme Criteria) of the Office of the Permanent Secretary for Higher Education, Science, Research and Innovation (OPS) by the course, and conduct the examination of the data of Component 1 Governing Standard to meet the programme standards annually.

Component 2 Development Criteria – Use the ASEAN University Network Quality Assurance (AUN-QA) guidelines, which the programme uses to conduct assessment for development according to the criteria. Pass a written self-assessment report (SAR) every year and if the course has been certified to meet the AUN-QA criteria, it will be assessed at least once in 5 years.

The programme is designed together by the key faculty members participating the annual department seminar. The draft version is presented at the meeting and all academic staffs participating the department seminar would provide critical comments and opinions. Feedbacks from stakeholders such as those from business are the important in shaping the programme. The programme chairs are responsible in writing and revising the programme in detail. The programme committee consists of the faculty members and the programme chair.

The programme and course are evaluated based on the Thai Qualification Framework (TQF) for Higher Education. TQF3 is submitted at the beginning of the semester to show the teaching plan. TQF5, which is the course evaluation, is then submitted 15 days after the end of the semester. TQF7, which is the programme evaluation, is submitted within 60 days after the end of the semester. The evaluation is done in accordance to the TQF process. All the documents are submitted to the Office of Higher Education Commission.

2. **Graduates (must follow the PLOs)**

The quality of graduated students from this programme is compiled with National Standard for Higher Education. The programme produces electrical, electronic, telecommunication, control and computer scholars/engineers, at doctoral level, who have professional knowledge and skills in research and development at international standard level. In addition, the graduates have good international communication skill for effective technology transfer with professional ethics and research ethics. The programme conducts the qualifying examination, the proposal defense examination, and the final dissertation examination to guarantee that the quality of graduated students follows the program learning outcomes (PLOs).

3. **Students**

3.1 Student admissions and pre-study preparation

Students graduating with B.S. degree or M.S. degree are eligible to apply to this programme. Research funding and scholarships are also provided for outstanding incoming

students and enrolled students. Each student has a research advisor since the first term of enrollment. Programme chair and supporting staffs provide guideline and suggestion throughout the academic enrolment. Students can contact the programme coordinators directly during the weekdays, in regular hours, as well as via emails and messaging.

3.2 Supervision of Academic Counseling and Student Guidance either about learning or other matters including monitoring and reporting on persistence and graduation results.

During the semester, student's progress is monitored by the lecturer of the courses the student admits or else the research adviser. Semester wise records e.g. grade, GPA are maintained by the designated department officer and are informed to the students at the end of each semester. In case a student obtains GPA below 3.0, he or she will be put under a special observation and needs to discuss with the graduate adviser before taking any course in the future.

3.3 Satisfaction and outcomes of student complaints management as part of the course management process

Students who are considering making a complaint may seek suggestion and support from their advisors. Students may make a complaint to the programme chair by submitting the student complaints form to the department. Then the Programme Committee will make a judgement or investigate the complaint.

3.4 Implementation of the programme if the learner fails to meet Defined Stage-LOs/CLOs.

For all students, progress exam is expected to be taken at the end of each semester. Thesis committee will monitor students stage learning outcome and assess thesis credits that students should earn. Students whose progress is unsatisfactory will be notified and will receive a suggestion from their advisors to develop a plan to address the deficiencies.

4. **Lecturers**

4.1 The process of recruiting and selecting new teachers

The programme seeks new faculty members that are active and excel in a certain research area with good command of English to fulfil the programme requirement. Each faculty candidate will be interviewed by 3-4 faculty members selected as the interview committees. The result will be obtained based on the consensus from all faculty members in a department meeting.

4.2 The process of promoting and developing teacher skills

A new faculty member is then assigned two mentors – Academic mentor and Social mentor. The academic mentor provides consults on teaching, research, and academic service while the social mentor provides guidance on the organization culture and social life in the university. The University provides a guideline to a new faculty member for necessary teaching techniques, university policies, and development directions.

4.3 Satisfaction and results of handling complaints related to teachers, for example, teachers failing to teach according to CLOs, etc.

Teacher evaluation relies on classroom observations conducted by the Programme Committee. The evaluation will be made with the help of CLOs, teaching plan and method, or rubrics. Students will also assess teaching performance at the end of the course.

5. **Programme, Teaching and Learning Approaches and Student Evaluation**

5.1 Programme

The programme follows and Thai Qualification Framework (TQF) and ASEAN University Network Quality Assurance (AUN-QA) guidelines. The curriculum will be revised once in 5 years according to self-assessment report (SAR), suggestion from external committee, and feedbacks from stakeholders.

5.2 Teaching and Learning Approaches

The programme committee and faculty members meet twice a year to discuss problems and issues in the teaching and learning process, and review trends in technologies and job markets to offer relevant elective courses to students. The university has the instructor evaluation system where students rate various aspects of teaching and learning process and provide comments in each class. Those feedbacks are taken to improve the teaching and learning process.

5.3 Student Evaluation

Student competencies are developed under supervision of research advisor. Student stage learning outcomes are monitored and assessed by qualifying exam, English proficiency test, proposal exam, publication requirement, and thesis defense exam.

6. Learning Supports

The department has two 80-seat lecture rooms, two 40-seat lecture rooms, two 40-seat computer labs, and one common room for the students. Each classroom is equipped with a projector screen, visualizer, whiteboard, and audio equipment. The department office area has cubicles for support staff and each faculty member has a separated office. Wireless network access is provided by the university to students and staff members with university account authentication while a high-speed wired network access managed by the department is available to staff members in the department office area and classrooms. Over 10,000 textbooks including E-books in electrical, electronic, telecommunication, control, computer engineering or related fields are available at the university library while journal articles and proceedings via several online databases such as IEEE Xplore, ScienceDirect, Scopus, Web of Science (Clarivate) through the university subscription. The library has four floors and provides abundant space and comfortable atmosphere that facilitate learning.

The department has assigned rooms to research groups of faculty members. Each room is independently managed and responsible by its members, supervised by the faculty member(s). Ph.D. students can utilize the research rooms at any time with personal key cards. However, students are not permitted to stay overnight at any research laboratory/room.

7. Key Performance Indicators

Key Performance Indicators	Academic Years				
	2022	2023	2024	2025	2026
1. At least 80% of curriculum committee who are in charge of the program participate in meetings on planning, tracking, and reviewing the curriculum	x	x	x	x	x
2. Having curriculum detail in TQF-2 format in accordance with the national qualifications framework or computer engineering qualification standard (if any).	x	x	x	x	x
3. Having every course detail in TQF-3 format before the beginning of each semester	x	x	x	x	x
4. Prepare reports on teaching performance in TQF-5 and TQF-6 formats of every course offered within one month after the end of each semester.	x	x	x	x	x
5. Prepare a report on operational performance of the curriculum in TQF-7 format within two months after the end of each academic year.	x	x	x	x	x
6. Verify and review student achievement at least 25% of all courses offered in each semester based on the TQF-4 standard	x	x	x	x	x
7. Develop/improve teaching and learning, teaching strategies or learning assessment in accordance with operational performance report of the previous academic year.		x	x	x	x
8. New lecturer (if any) will be given advises in teaching preparation following the curriculum.	x	x	x	x	x
9. Every lecturer will be supported on technical and/or professional development at least once a year.	x	x	x	x	x
10. At least 50 % of teaching support staff (if any) will be supported on technical and/or professional development each year.	x	x	x	x	x
11. The average score of satisfaction level from final year students or new graduates on courses quality is at least 3.51 out of 5.0.			x	x	x
12. The average score of satisfaction level from employers on new graduates is at least 3.51 out of 5.0.				x	x

Section 8 Evaluation, Improvement, and Implementation

1. Assessing the Effectiveness of Teaching

1.1.Teaching Strategies Assessment

In the pre-teaching phase, teaching strategies should be assessed by the instructor team or department members and/or in consultation with a curriculum development or teaching methodology specialists. In the post-teaching phase, there should be an analysis of teaching evaluation results by students, and analysis of students' academic performance.

1.2.Assessing Teachers' Skills in Using a Teaching Strategy Plan

At the end of each semester, students assess instructors' teaching in all aspects, including skills, teaching strategy, punctuality, clarification of goals, course objectives and evaluation criteria, as well as the use of teaching media in the courses. The person in charge of the programme uses the results of student assessments to help assess the instructor skills in using the teaching strategic plan.

2. Overall Programme Assessment

Evaluation of the overall programme composed of the followings.

1) Qualification of the applicants
2) Teaching evaluation and research outcomes of the faculty members and students in the programme
3) Feedback from alumni of the programme
4) Administration and operation of the programme
5) Satisfaction evaluation and feedback of the graduates and organizations who employ the graduates
6) Feedback from industries that are in related field (not necessarily the employers for the graduates)
7) Feedback from external reviewers of the programme

3. Evaluation of the Performance According to the Programme Specification

The programme and course are evaluated by internal-university quality assurance process (IQA). Essentially, they are evaluated based on the Thai Qualification Framework (TQF) for Higher Education. The annual assessment of the programme operations is conducted and complied with the performance indicators presented in section 7 and with the objectives of the programme presented in section 2 by the assessment committee from the Faculty of Engineering. The committee consists of at least two persons; in which one is the lead assessor. The majority of the assessors must be from outside university, and at least one person in the committee should have qualifications in the same or related fields.

4. Review of Evaluation Results and Plans for Improvement

From the evaluation result, the update plan consists of the followings.

1) Update courses with up-to-date materials (hot topics, tools, techniques and technologies).
2) Provide English courses and English proficiency test such as TOEFL for students who needs to improve their English proficiency to meet the programme requirement.
3) Improve the administration and organizations to provide adequate aids to students for English proficiency test preparation and deliverables throughout the Ph.D. programme.
4) Encourage and support faculty members to stay active in the research field and participate in professional forum nationally and internationally.

Appendices

Appendix A **Executive Summary**

Appendix B1 **Course Descriptions and Course Learning Outcomes**

Appendix B2 **Table showing the comparison of the old and the revised programme**

Appendix B2 **Table showing the comparison of the PLOs and the national TQF**

Appendix C **Details of the programme lecturers in-charge, full-time lecturers, and guest lecturers**

Appendix D **Order of programme development committee or programme screening procedure committee or person in-charge**

Appendix E **KMUTT Regulations on Graduate Studies of the Year 2019 (2562 B.E.) and the affiliation's educational announcements/regulations**

Appendix F **MOUs made between domestic and foreign organizations**

Appendix A Executive Summary

Doctor of Philosophy Program in Electrical and Computer Engineering

(International Program)

Faculty of Engineering, King Mongkut's University of Technology Thonburi

Curriculum Revision 2022 (2565 BE), Starting Semester 1/2022

Section 1. Rationales for Curriculum Revision

1.1) An analysis of the situation and environment that affects the revision of this program.

a) External Environment Analysis

a1) Analysis of the needs of key stakeholders related to the curriculum, including graduate users, students (current students and alumni), parents, institutional administrators, and personnel (relevant professors and employees).

Doctor of Philosophy Program in Electrical and Computer Engineering (International Programs) has been opened since 1998 by the Department of Computer Engineering, Faculty of Engineering, King Mongkut's University of Technology Thonburi. The curriculum revision is to respond to the needs of the Royal Thai government and private sectors for producing high quality graduates with advanced research capability that can create new knowledge and transfer knowledge effectively including having appropriate morals and ethics.

The curriculum committee had conducted the feedback survey in 2020-early 2021 from both academic and industrial sectors in order to find the needs of the required competency of the graduates. The feedbacks of the alumni from the program are also included. These feedbacks and comments are used to design and improve the curriculum with an emphasis on the learning outcomes of the learners as well as improving the course management to be more efficient.

Essentially, feedbacks from stakeholders were collected and analyzed for the program curriculum update. They are including current students, alumni, employers of the graduates, industries that can be potential employers, external program reviewers from academic institutions and industries, faculty members and supporting staffs. The feedbacks from current students and alumni are shown in the following page. There were 11 individuals responded to the program survey. Among these, 4 individuals were alumni (graduated in 2016-2020).

In addition, the feedback from employers of the graduates in this program were collected during January- May 2021. Five persons (employers) responded to the program survey with very positive results, satisfying with the graduates (employees) who have strong technical knowledge to handle challenging problems in related area of study, have good communication skills with professional ethics and research ethics. Some of our graduates are associate professors about 5-6 years after graduation, while some others have administration positions as department chair or vice dean in their universities. They are successful in their academic positions.

Table 1. Details of feedback survey from the stakeholders

Stakeholders	Survey Period	Method	Survey Issues/ Results	Learning Outcome
University	-	Study KMUTT students QF	KMUTT Students **Results:** PLOs with integrated KMUTT QF and student QF	PLO1, PLO2 and PLO3 are aligned with KMUTT students QF.
Faculty members	Before, between and at the end of each semester	Meetings	CLOs, course content, teaching method, exchange information and problem discussion. **Results:** constructive PLOs & CLOs	CLOs, all courses are associated with the PLOs.
Current students and graduates	During study time and after graduation. September 2020, March 2021	Survey forms, personal interview with some graduates	Satisfaction of the curriculum in all aspects, job type and job position of the graduates, ability to apply knowledge to solve problem at work. **Results:** Good with more than 80% satisfaction.	PLO 1, PLO 2, PLO 3
Employers	March 2021	Survey forms	Satisfaction of the graduates (employees) and ability of the graduates in many aspects. Results: very high satisfaction	PLO 1, PLO 2 and PLO 3
External curriculum reviewers	May-July 2021	Survey forms, curriculum committee meetings	Suitability of the curriculum. To produce qualified graduates for current demand from employers and industries. **Results:** The curriculum is suitable. More courses can be added to serve the demand from industry and employers. Details are in the last table of the executive summary.	PLO 1, PLO 2 and PLO 3

Details of the feedback from current students and alumni (graduates) (7 students and 4 graduates)

- They are satisfied with the required courses (at least 80% of students and graduates)
- They are satisfied with the elective/special topic courses (at least 80% of students and graduates)
- They can apply the knowledge and skills to solve related problems. (all students and graduates)
- More courses with modern/latest technologies or algorithms should be provided in the program (a few students and graduates)
- Overall, they are satisfied with the program study. (at least 80% of students and graduates)
- Most graduates work as lecturers/professors in universities/ academic institutions. A few graduates work as researchers/experts in private sectors.

Details of the feedback from employers of the graduates (5 employers)

- All employers are very satisfied with the knowledge and problem solving skills of the graduates.
- All graduates have a life long learning skill and able to handle challenging problems.
- All graduates have effective communication skill to obtain, present and transfer the knowledge.
- All graduates are diligent and well performed with good ethical standards.

Details of the feedback from external program reviewers

- The programe study is suitable.
- More courses can be added to serve the demand from industry and employers.
- Research and work ethics should be exercises via the provided courses. (via required courses: research methodology, seminar and independent study)

a2) Macro-environmental analysis, including demographics, economic, social, cultural, technological, political, policy or related legal conditions

Economic situation that should be considered in curriculum update/revision, is depended on the draft of 13th National Economic and Social Development Plan (2023-2027) which will help transform the country. It has five main goals as follows:

1. Restructuring of production, into an economy based on innovation that aligns with technology trends and global trade
2. Developing human resources to have the ability and quality of life suitable for the new world
3. Creating a society of opportunity and fairness
4. Creating sustainability for the country
5. Preparing the country to cope with risks and changes in a new global context

Thailand's economic model is aimed at pulling the country out of the middle-income trap, and developing it as a high-income country. The new Thailand's economy structure will be based on knowledge, technology and innovation. According to global megatrends, which are 1) Advancements in technology and innovation, 2) Changes in population structure, 3) Health care and medical treatment, 4) Climate change, 5) Global efforts to reduce greenhouse gas emissions,

6. Renewable energy and electric vehicle,
7. International political economy trends,
8. Changes in lifestyle and social culture,
9. Occupations in future and
10. Urbanization, these will affect or influence the country situation and lead to the direction of the national development.

However; since the COVID-19 crisis in 2020, the needs for digital technology and disruptive innovation for the 4th industrial revolution are accelerated in order to stay competitive in any sectors. The 13 targeted strategic plans have been drafted in order to achieve a value-creating economy as well as the sustainability society. The related strategic plans are as follows.
1. Electric vehicle production base
2. One-stop service medical and health center
3. Smart electronics production and digital service base
4. Circular economy and low-carbon society of Thailand

The continuous investment in research and development of advanced knowledge and technology will support the new economy. The disruptive-technology knowledge such as smart devices, robotics, mechatronics, cyber security, internet of things, artificial intelligence, embedded technology, energy storage, renewable energy and etc., will play the important role in these strategic plans. The integration of these essential knowledge must be included in the curriculum which emphasize on producing the graduates that answer to the country's sustainable development. According to the draft of 20-year strategic plan of human resources development in research and innovation (2017-2036) by National Research Council of Thailand (NRCT), the Ph.D. graduates in science and technology field are needed to for the target S-curve industries. Thus, this curriculum has been continuously revised in order to be aligned with the national development strategy. The qualified graduates that are capable of advanced research and development, will create new knowledge and innovation by integrating local knowledge with academic knowledge. The graduates will also be aware of the intellectual property in order to prevent the intellectual property infringement.

Advanced information and communication technology (ICT) can be regarded both as tools to reduce inequality while enhancing Thailand's competitive edge, and as threats to the country's development. The pace of change in information technology is so rapid that it leaves slow and deliberative process of law and political policy behind and in effect these technologies become lawless, or extralegal. Wrong usage of information technology as well as the terrorism problem can influent the new curriculum direction in the way to develop the advanced technologies for electronic, multimedia communication networks, online and offline database, security system with block chain, smart system and automation, and etc. The impact on society and culture from the new technologies will be the concern of the graduates from this new curriculum. The environmental effect such as air, water and noise pollution will also be the concern of the graduates. The green technologies (such as renewable energy or electric vehicle) with the government policy will become competitive and provide the new living society. Thus, this new curriculum will provide knowledge together with morals, leaderships, honesty, social responsibility and team work skills.

a3) Competitor/Comparative Competitor analysis

We consider 3 selected related Ph.D. programs in Thailand which are provided at Chulalongkorn University, Sirinthorn International Institute of Technology (SIIT) and Kasetsart University as shown in the Table 3. It is shown that among them, only SIIT offers the international program. In addition, they accept only applicants with Master degree. Our program at KMUTT is an international program that accept applicants with Bachelor degree as well as with Master degree. In addition, this program has 3 different study plans with different publication requirements to enhance the program learning outcomes which will be explained in later section.

- KMUTT curriculum offers an international program which only Sirindhorn International Institute of Technology (SIIT) offers, while other universities offer the program in Thai.
- Both bachelor's and master's degree applicants are eligible while Sirindhorn International Institute of Technology (SIIT) only accepts master's degree applicants.
- KMUTT curriculum offers 3 different study plans with different publication requirements. Students have options based on their qualification and interest.
- KMUTT curriculum has 4-joined departments which are Computer Engineering, Electrical Engineering, Electronic and Telecommunication Engineering, and Control System and Instrumentation Engineering Departments, consisting of more than 50 expert professors. So, we have more research areas to offer to students to work on than from each of the programs offered from other universities.

Table 3. Competitiveness with Other Ph.D. Programs

Doctoral Degree Study Plan	**Computer Engineering Chulalongkorn U.**	**Engineering and Technology, Sirinthorn International Institute of Technology (SIIT)**	**Computer Engineering Kasetsart University**
Study Plan	Plan A(1) =72 credits for students with Bachelor degree Plan A(2) =60 credits for student with Master degree	Offer for students with Master degree Plan 1 = 60 credits Plan 2 = 60 credits	Plan1.1 = 52 credits for students with Master degree Plan 2.1 = 72 credits for students with Bachelor degree
Number of Course Credits	Plan A(1) = 24 credits Plan A(2) = 12 credits	Plan 1 = 0 credits Plan 2 = 12 credits	Plan 1.1 = 14 credits (not counted as credits) Plan 2.1 = 18 credits (not counted as credits)
Number of Dissertation Credits	Plan A(1) = 48 credits Plan A(2) = 48 credits	Plan 1 = 60 credits Plan 2 = 48 credits	Plan 1.1 = 52 credits Plan 2.1 = 72 credits
Program Type (Thai or International)	Thai program	International program	Thai program
Publication Requirement	2 peer-reviewed international Journals, or 1 ISI international journal and 2 international conference papers		

b) Internal Environment Analysis

b1) An analysis of the program's past performance (last 5 years)

1) Graduation and dropout rates of students in the program:

Academic Year	**Number of new students**	**Number of graduated students**	**Number of dropout students**
2015	3	8	2
2016	5	4	1
2017	4	9	1
2018	2	7	0
2019	4	1	0
2020	5	1*	1

* In the process of dissertation revision

2) Duration of study in this program:

Average graduation time is 5-6 years, which is more than the program study time.

3) Employment situation of graduates:

All graduates are currently employed. Most of them are university professors. Some of them work in private companies as experts.

4) Career path

Most of graduates have good progress in their career. Some of them have become Assistant Professor as well as Associate Professor which implies the very good performance at work.

b2) Resources Analysis

- Consists of more than 50 faculty members from 4 departments (Department of Electrical Engineering, Department of Computer Engineering, Department of Electronics and Telecommunication Engineering and Department of Control System and Instrumentation Engineering). This allows for a variety of fields that specialize in learning, teaching and researching.
- Adequate resources are available for teaching and learning and researching. For example, there are a spacious place, sufficient modern tools, equipment and materials. KMUTT, as the National Research University, also provides funding to support the cost of presenting and/or publishing research. It has a variety of research databases that can be accessed online from anywhere, at any time, such as IEEE, Scopus, and Web databases. of Sciences, etc.

b3) SWOT Analysis - Analysis of the strengths and weaknesses from the internal environment to create differentiation and competitiveness.

The feedback from survey of current students and alumni indicates that the curriculum has strength and Weakness as follows.

Strength

- A variety of expert professors from 4 departments
    - Computer Engineering department: artificial intelligence, high-performance computing and data analytics.
    - Electrical Engineering department: renewable energy.
    - Electronic and Telecommunication Engineering department: Internet of Things (IoT), computer vision and telecommunications.
    - Control System and Instumentation Engineerings department: advanced control systems design and predictive maintanance for industry.
- An international program with 3 study plans for applicants with bachelor/master degrees.
- Full-scholarships are available for both Thai and foreign students.

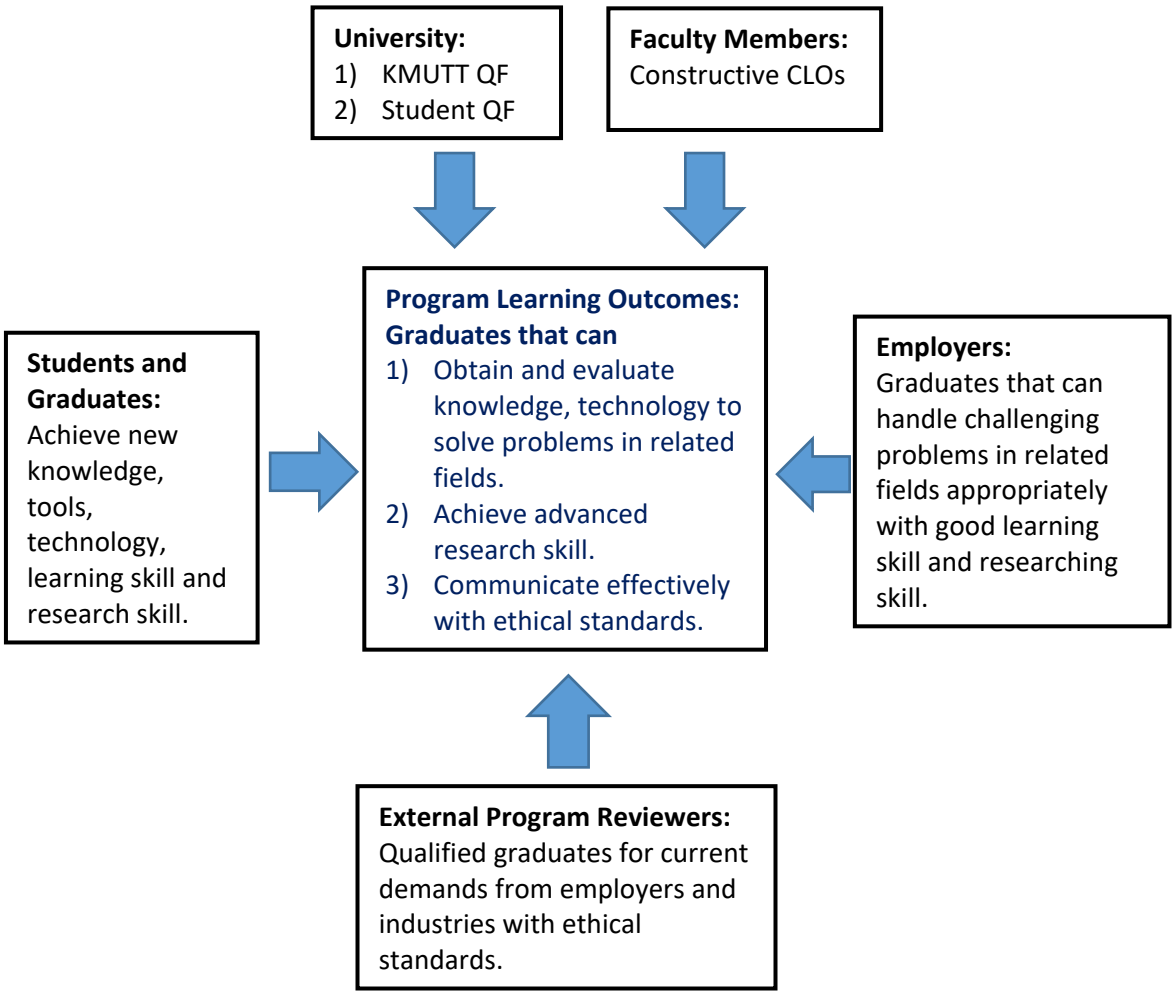
Weakness

- No international school/faculty is provided for international environment.
- English language proficiency is a challenge for some new-entry students.
- More modern and hot-topics should be provided as new courses.

1.2) The Essence of the proposed improvement of the program

c1) Explain and show that the analysis in Section 1.1 links to the design of the program, the improvement of the program and the determination of its learning outcomes for this revision with reasons.

Feedbacks from the stakeholders were extracted and summarized. They were mainly considered for the design of the program with coresponding learning outcomes (PLOs) as follows.



From the analysis of the situation and environment as shown in the previous section, the proposed curriculum revision has the main improvement plan as shown in the following subsection.

c2) Improvement plans

1) Update courses with up-to-date materials (hot topics, tools, techniques and technologies). Modern special-topic courses are provided based on the present demand. Examples of the courses are advanced artificial intelligence, deep learning, multimedia communications, image processing and computer vision, and adaptive control of power system (as elective/ special toptic courses).

   We are in the process of selecting some courses in this programme for **Micro-credentials (MC)** so that any graduate students or people from any organizations can enrole, so that they can gain knowledge, re-skill and up-skill which will be beneficial to their organizations.

2) Enhance the program's competitiveness to produce high quality learning outcomes which can be published in high ranking international publications.

   Plan A1: Two peer-reviewed international journal paper publication (full papers), where at least one of them has ISI indexed are required.

   Plans B1 and B2:

   (1) Two peer-reviewed international journal paper publication (full papers) are required, where at least one of them has ISI indexed or

   (2) One peer-reviewed international journal paper publication (full paper) with ISI indexed and two peer-reviewed international conference papers are required.

3) For students to be able to communicate efficiently in English both in written and oral forms, we provide English courses and English proficiency test such as TOEFL for students who needs to improve their English proficiency to meet the curriculum requirement at the early stage of their studies.

4) Improve the administration and organizations to provide adequate aids to students throughout the Ph.D. program.

5) Encourage and support faculty members to stay active in the research field and participate in professional forum nationally and internationally.

c3) Highlights of the program that differentiate itself and its ability to compete with other programs in the market.

- An international program for Thais and foreigners with an offer of KMUTT scholarship.

  There are a few international Ph.D. programs in Thailand in the areas related to electrical and computer engineering. Our graduates can work in many organizations as professors, experts, consultances, and researchers in academic, government and private sectors including industries.

- Various research areas and expertise are provided from four departments' faculty with over 50 professors.

- Applicants who graduated with bachelor degree are eligible to apply. Three different study plans are offered in this curriculum.

- Students can do the research abroad. There is research funding available under MOUs with foreign universities/institutions in many countries in Asia, Australia, Europe and America.

Section 2. Program Specification

2.1) Philosophy, Importance, and Objectives of the Program

The Doctor of Philosophy Program in Computer and Electrical Engineering (International Program) is designed to develop professionals who have the knowledge, intellectual disposition, ethical sensibilities, and research skills particularly in the field of Computer, Electronics and Telecommunications, and Control System and Instrumentation Engineering. They should be able to apply their knowledge to create innovations to solve engineering problems as well as to independently learn new technologies. In addition, they should have knowledge transfer skills to provide consultancy services for the sustainable development of the country.

Electrical and Computer scholars and engineers play an important role in the development of advanced technologies and innovations which are a vital foundation of Information Technology and telecommunications of the country. In the current global situations, massive on-line data and terrorism threat is increasing everywhere including in Thailand. Electrical and Computer scholars and engineers are even more essential to advance data analytic, visualization, detection and prevention technologies for efficient data processing-handling and national security. In addition, we concern with energy conservation, renewable energy, reliable and optimal system design. To escape the middle income trap, Thailand needs extensive qualified personals to increase its competitiveness especially in the research and development sectors.

The curriculum objectives are as follows.

1. To produce Electrical and Computer Engineering scholars and engineers, at doctoral level, who have professional knowledge and skills in research and development particularly in the field of Electrical and Computer Engineering.
2. To produce Electrical and Computer Engineering scholars and engineers who have good international (English) communication skill for effective technology transfer with professional ethics and research ethics.

2.2) Special Characteristics of the Graduates of the Program

The Doctor of Philosophy Program in Electrical and Computer Engineering (International Program) develops special characteristics of the graduates of the program according to program learning outcomes. The graduates should be able to:

- Perform advanced research
- Have good ethical and moral development
- Be responsible toward assigned task
- Have good skill in problem handling
- Have good project and time management skill
- Have life-long learning skill

- Present and transfer knowledge and technology effectively
- Have good communication skill in English

2.3) Expected Learning Outcomes

PLO1 : Evaluate existing knowledge, technologies and research problems in electrical, electronic, telecommunication, control and/or computer engineering.

PLO2: Achieve new knowledge with research ethics to improve or invent an advanced algorithm or a technique (innovation) to solve a research problem or an industrial problem in electrical, electronic, telecommunication, control and/or computer engineering area.

PLO3: Communicate effectively with ethical standards including research ethics and professional ethics through technical meetings, reports, proposals, and oral presentations.

Sub PLO 3A: Develop technical/research proposal and/or research reports in detail including problem statement, related literature and technology reviews as well as possible research contribution in the study area with ethical standards.

Sub PLO 3B: Communicate the knowledge and technologies effectively through technical meetings, and oral presentation with ethical standards.

Section 3 Developing Learning Outcomes and Methods of Assessment in order to develop learners to achieve learning outcomes of the Programme.

3.1) Describe strategies to improve learners' learning outcomes by demonstrating constructive alignment of PLOs/CLOs, teaching and learning approach and methods of assessment.

For each subject, we provide examinations to evaluate the students' achievement both in written and presentation forms. We use project or assignment to evaluate the students' achievement. In addition, we conduct a survey form with a few questionnaires to get feedback from the students in the programme.

For Dissertation, the student must pass a qualifying examination, a dissertation proposal defense and final dissertation defense examination.

Qualifying examination (QE) is to assess background knowledge and research skill of students in a specified research area. Essentially, review of literature and state-of-art advanced algorithms/approaches for related research problems should be covered with extensive analysis. This exam has the following policies.

- The QE committee consists of four members which are a research advisor and three other committee members, where one of them is pre-selected as a representative of the Ph.D. programme committee. The research advisor and co-advisor (if any) are considered as a single committee.
- The exam is in oral presentation form with a QE report submitted at least 3 weeks to the department prior to the exam schedule. The report must be complied with KMUTT thesis report format. The oral presentation exam is about 30 minutes with 30-minute addition for questions and answers.

- The exam results can be one of these results: pass (without condition), pass with condition and fail. For the pass with condition, the student has 30-60 days to revise the QE report to present or get an approval from all committee members. For the fail condition, the student must request for the second round of QE in the next semester. Students in study plans A1 and B1 are required to pass the Ph.D. QE within the first 3 semesters before dissertation credits can be registered, while students in study plan B2 are required to pass the QE within the first 4 semesters.

Dissertation proposal examination is scheduled in the following semester after the student passed the QE and has selected a research topic and obtained sufficient research knowledge. The contents of the proposal include problem statement, related work, research objective and scope of work, research contribution, research methodology, preliminary research result, discussion and validation.

- The thesis proposal defense requires a committee of at least 5 faculty members and/or experts under university requirement, consisting of the student's advisor(s), at least one faculty member outside the 4-joined departments (CPE, EE, ENE and INC), at least one faculty member or expert outside the university, and two faculty members in the 4-joined department.

- The exam is in oral presentation form with a research proposal report submitted at least 3 weeks to the department prior to the exam schedule. The report must be complied with KMUTT thesis report format. The oral presentation exam is about 30-45 minutes with 30 minutes in addition for questions and answers.

- The exam results can be one of these results: pass (without condition), pass with condition and fail. For the pass with condition, the student has 30-60 days to revise the proposal report to present or get an approval from all committee members. For the fail condition, the student must request for the second round of proposal exam in the next semester. If the student fails the proposal exam twice, he/she will be dropped from the programme.

Research progress examination is to evaluate research progress of the student when he/she register for dissertation credits but does not have QE/proposal/final defense exam in that semester. This progress exam is also to assess the number of dissertation credits that the student can earn based on the amount of research conducted throughout the semester. The contents of the report include research problem statement, information of research obtained in this semester with result, analysis and discussion as well as future work. The followings are the corresponding policies.

- The exam requires three committee members consisting of the research advisor and two other members from the proposal exam. If the student has not done with the proposal exam, the two committee members have to be chosen from the 4-joined departments.

- The exam is in oral presentation form with a research progress report submitted at least 2 weeks to the department prior to the exam schedule. The oral presentation exam is about 15-30 minutes with 15-30 minutes in addition for questions and answers.

Final dissertation defense examination: After the student has passed the English proficiency test (TOEFL 550 or equivalent, as shown in the following table) and completed the dissertation with approval from the research advisor, the student can register to complete the remaining research credit(s) and submit documents for final dissertation defense. The final

dissertation report must compile with university thesis report format, and must be submitted to the programme staff (programme coordinator) hosted at the computer engineering department at least 3 weeks prior to the final defense schedule. The followings are the corresponding policies.

English test and equivalent score requirement for graduation

English Test	**Equivalent Score**
ITP TOEFL	550
TOEFL PBT (Paper-based Test)	550
TOEFL CBT (Computer –based Test)	213
IELTS	6.0
CEFR (Cambridge English test)	C1

- The same group of committee from the proposal defense exam will evaluate the dissertation research from oral presentation, dissertation report and research publication result.
- The exam is in oral presentation form with the final defense report submitted at least 3 weeks to the department prior to the exam schedule. The report must be complied with KMUTT thesis report format. The oral presentation exam is about 40-60 minutes with 30-45 minutes in addition for questions and answers.
- The exam results can be one of these results: pass (without condition), pass with condition and fail. For the pass with condition, the student has 30-90 days to revise the proposal report and complete additional research (if any) according to the reviewers' feedback. Then the student must submit and present the research report revision to all committee members for a consensus approval. For the fail condition, the student must request for the second round of the final exam in the following semester. If the student fails the final defense exam twice, he/she will be dropped from the programme.

Maximum number of accumulated dissertation credits that can be earned from the main exams.

Passed examination	**Eligible credits to earn**	**Study plans A1 and B2**	**Study plan B1**
Progress Exam	12 credits	12 credits	12 credits
Proposal Exam	2 out of 3 of total research credits	2/3 of 48 credits = 32 credits	2/3 of 36 credits = 24 credits
Final Defense Exam	all	48 credits	36 credits

Note: the number of earned research credits in a semester cannot exceed the number of registered credits in that semester. The earned credits are evaluated by the examination committee.

Table of Summary of PLOs

Program Learning Outcomes	Teaching and learning approaches	Assessment methods
PLO 1: Evaluate existing knowledge, technologies and research problems in electrical, electronic, telecommunication, control and/or computer engineering.	- Classroom lecture and discussion - Class project, homework and assignments - Enforce study on current and new technology in electrical and/or computer engineering to solve related problems - Advice on literature review of related knowledge and technology	- Class examination - Evaluation of class project, homework and assignments - Project presentation - Qualifying examination
PLO 2: Achieve new knowledge with research ethics to improve or invent an advanced algorithm or a technique (innovation) to solve a research problem or an industrial problem in electrical, electronic, telecommunication, control and/or computer engineering area.	- Design and develop a problem solving model using appropriate research methodology - Weekly or bi-weekly research meetings with research advisor - Paper publication writing workshop	- Dissertation proposal examination - Project/research results and evaluation - Research progress examination - Final dissertation defense examination - Number of paper publication and the quality of the research paper based on publication type and its ranking.
PLO 3: Communicate effectively with ethical standards including research ethics and professional ethics through technical meetings, reports, proposals, and oral presentations.		
Sub PLO 3A: Develop technical/research proposal and/or research reports in detail including problem statement, related literature and technology reviews as well as possible research contribution in the study area with ethical standards.	- Research progress and proposal report writing with regular feedback from the advisor - Technical writing with feedback from the teacher - Professional ethics and research ethics are exercised and enforced in the research/technical writing - A proposal/progress exam committee with 3-5 professors are formed to advise and assess the research proposal/pregress.	- Technical/research report in class - Qualifying examination - Dissertation proposal examination - Research progress examination - Final dissertation defense examination
Sub PLO 3B: Communicate the knowledge and technologies effectively through technical meetings, and oral presentation with ethical standards.	- Weekly or bi-weekly research meeting discussion and presentation with the research advisor. - Slide presentation design with good visual aids and infographics for effective communication. - Effective oral presentation/communcation with ethical standards.	- Technical/research presentation in class - Qualifying examination - Dissertation proposal examination - Research progress examination - Final dissertation defense examination

3.2 Stage-LOs

- Specify the learning outcomes in accordance with the students' development process of the program along with the method of assessment at each stage.

Stage-LO 1 **= PLO 1 Level 1 +** **PLO 3 (3A+ 3B)** **Level 1**	• Obtain existing knowledge and technologies in electrical, electronic, telecommunication, control and/or computer engineering. • Analyze and evaluate the knowledge and technologies including advantages and disadvantages of each one. • Review of related literature and state-of-art advanced algorithms/approaches. • Review research problems with extensive analysis in both written and oral forms • Ethical standards are applied in communication in both written and oral forms.
Period of Assessment	Year 1 of program plans A1 & B1 Years 1 & 2 of program plan B2
Methods of Assessment	Class examinations, class's assignments Qualifying examination: written report and oral presentation Technical/research report and presentation
Rubrics of Assessment	Class's grading results Qualifying examination's results

Stage-LO 2 **= PLO 1 Level 2 +** **PLO 2 Level 1 +** **PLO3 (3A+ 3B)** **Level 2**	• Design a research methodology, a procedure for an advanced algorithm or a technique to solve a technical/research problem or an industrial problem. Provide a procedure to conduct computer simulations or experiments for result evaluation with ethical standards. • Apply the obtained knowledge, skill, or an advanced algorithm/technique to solve a research problem or an application/industrial problem.
Period of Assessment	Year 2 of program plans A1 & B1 Year 3 of program plan B2
Methods of Assessment	Class examinations, class's assignments Dissertation proposal examination Research progress examination Technical/research report and presentation
Rubrics of Assessment	Class's grading results Dissertation proposal examination's results Research progress examination's results

Stage-LO 3 = PLO 2 Level 2 + PLO3 (3A + 3B) Level 3	• Develop a technical/research proposal and research progress reports in detail. • Apply ethical standards including research ethics and professional ethics. • Communicate the knowledge and technologies effectively through technical meetings, and oral presentation with ethical standards.
Period of Assessment	Year 3 of program plans A1 & B1 Year 4 of program plan B2
Methods of Assessment	Class's presentation and report Research paper writing and research presentation English proficiency tests Research progress examination Final dissertation defense examination
Rubrics of Assessment	Class's grading results Research paper and research presentation's results English proficiency test's score (e.g. TOEFL, IELTs) Research progress examination's results Final dissertation defense examination's results

3.3 Structure of Programme

3.3.1) Comparison of the old programme structure with the announcement of the Ministry of Education regarding curriculum standards as follows:

Programme Study	Number of credits			Difference of Number of Credits
	OHEC Framework	Original Program 2560 B.E.	Revised Program 2565 B.E.	
Plan A1: applicants who earned master degree				
Dissertation	≥ 48	48	48	0
Number of total credits	≥ 48	48	48	0
Plan B1: applicants who earned master degree				
Core Courses	≥ 12	6	6	0
Elective Courses		6	6	0
Dissertation	≥ 36	36	36	0
Number of total credits	≥ 48	48	48	0
Plan B2: applicants who only earned bachelor degree				
Core Courses	≥ 24	6	6	0
Elective Courses		21	21	0
Dissertation	≥ 48	48	48	0
Number of total credits	≥ 72	75	75	0

*****Office of the Higher Education Commission: OHEC

3.3.2 Explain concepts in designing the program and its content that are implemented to develop learners to achieve the learning outcomes of the program.

Objectives of the Program:

1) To produce electrical, electronic, telecommunication, control and computer scholars/engineers, at doctoral level, who have professional knowledge and skills in research and development.

2) To produce electrical, electronic, telecommunication, control and computer scholars/engineers who have good international communication skill for effective technology transfer with professional ethics and research ethics.

For the learners to achieve the program objectives and program learning outcomes, the followings are provided.

1) An International program in electrical, electronic, telecommunication, control and computer engineering with various study topics offered from 4 engineering departments of KMUTT, where both Thais and foreigners can study. Students must be able to communicate efficiently in English in both written and oral forms. English proficiency test is enforced.

2) Three study plans for applicants who graduated with bachelor degree or with master degree in related fields of electrical and computer engineering.

3) Core courses and elective courses with up-to-date materials (hot topics, tools, techniques and technologies). Modern special-topic courses are provided based on the current demand of students, prospective employers and industry. Examples of the modern courses are advanced artificial intelligence, deep learning, multimedia communications, image processing and computer vision, modern control, and adaptive control of power system.

4) High quality researchers and graduates are expected from the program. Students can publish research outputs in high ranking international publications. The publication requirement for the study plans is as follows.

    Plan A1: Two peer-reviewed international journal paper publication (full papers), where at least one of them has ISI indexed.

    Plans B1 and B2: Two peer-reviewed international journal paper publication (full papers) where at least one of them has ISI indexed, or

    One peer-reviewed international journal paper publication (full paper) with ISI indexed and two peer-reviewed international conference papers.

Section 4. Input Factors

Qualification of the candidates in the program:

1) Students' intake is managed by the admission committee consisting of at least two faculty members from the computer engineering department, electrical engineering department, electronic and telecommunication engineering department and/or control engineering department. Each applicant is screened and accepted based on the criteria specified by the University and the Faculty of Engineering. The requirements for applicants are as follows:

2) Background degree: Master degrees or Bachelor degrees with the first class honor or second class honor in computer engineering, computer science, applied science, electrical engineering, or equivalent. Applicants are required to have GPA at least 3.25 out of 4.00 or else have published research paper(s) in the study area. An applicant with degree in related fields is subject to an approval from the admission committee.

3) Qualification for non-coursework plan: applicants must have strong background in conducting research with at least two paper publication, or else have completed Ph.D. coursework from an academic institution.

4) English proficiency: pass the KMUTT language requirement for Ph.D. students who apply to the program in 2022 or later. The requirement is to pass TETET 5.0 or equivalent, as shown in the folloqing table. Other students are required to take LNG 601 which is an English course as a prerequiresite.

5) Two letters of recommendation.

* The KMUTT language requirement may be subject to changes based on the latest KMUTT announcement.

English test and equivalent scores

English Test	**Equivalent Score**
ITP TOEFL	500
TOEFL PBT (Paper-based Test)	500
TOEFL iBT (Internet-based Test)	72
IELTS	5.5
TETET	5.0

Section 5 Opinion of external experts and implementation of suggestions

Summary of external experts' opinion and implementation of suggestions

Regarding summary of comments from the external readers and responses to the readers' comments, please clearly specify in which parts of the curriculum have been adjusted and how to adjust. Please report only the parts that reflects the quality of teaching and learning management in the curriculum.

Name-Surname: Prof. Dr. David Banjerdpongchai Position: Professor Affiliation: Department of Electrical Engineering, Faculty of Engineering, Chulalongkorn University Reader's Expertise: Academic Overall Evaluation: Agree with the curriculum, but please consider the reader's comments.	
Opinion of external experts	Response to the opinion
For the main parts: - Please specify the topics or fields of study that the curriculum focuses on at least 4 topics. - It is recommended to organize a training course or a workshop on research and work ethics for students, because it is important in the research process.	For the main parts: - Because this curriculum has a variety, both in terms of the content of the courses opened and the expertise of the instructors of the courses. It is therefore difficult to clearly identify the 4 topics that the curriculum focuses on. However, the course contents can be divided into 4 sub-disciplines: computers, electrical power, electronics and automatic control system, and students can choose to do research on a topic that integrates knowledge in the above 4 fields. - The topic of research and work ethics has been taught in the course "Research Methodology". More details on this topic will be included in the related PLO in the complete version of the curriculum book. In addition, other required courses which are seminar and independent study also include research and professional ethics thoughout literature survey, knowledge and technology analysis and evaluation, as well as presentation.

Name-Surname: Prof. Dr. Thanaruk Theeramunkong Position: Professor Affiliation: School of Information, Communication and Technology (lCT), Sirindhorn International Institute of Technology, Thammasat University. Reader's Expertise: Academic Overall Evaluation: Agree with the curriculum, but please consider the reader's comments.	
Opinion of external experts	Response to the opinion
For the main parts: - Will the subjects in the curriculum focus only on electrical and computer engineering? The class subjects in the CPE category are so many compared to the subjects in other engineering categories. - There are questions about whether the timing of exams such as qualification exam and coursework should be consistent or not. In fact, some curriculums do not allow exams until the coursework is completed.	For the main parts: - The curriculum committees clarified in the meeting that course contents in the curriculum can be divided into 4 sub-disciplines: computers, electrical power, electronics. and automatic control system. In the forthcoming curriculum, some courses in the CPE category may be considered withdrawal, especially courses that are rarely taught at present. To see trends and overview of the courses in the curriculum more clearly. - Due to the new graduate regulation, the qualifying exam now have to be taken and passed before students can register for dissertation credits. However, students can take courses offered in each semester in every year, depending on their interest and recommendation from research advisor and committee. In addition, there are restrictions on the number of credits allowed to be collected before the dissertation proposal is approved depending on the student's study plan. The above details have been specified in the curriculum book. However, the curriculum committees will consider adding more details for more clarity.

Name-Surname: Asst. Prof. Dr. Akara Prayote Position: Assistant Professor, Head of Department of Computer and Information Science Affiliation: Department of Computer and Information Science, Faculty of Applied Science, King Mongkut's Institute of Technology North Bangkok Reader's Expertise: Academic and Graduates' Employer Overall Evaluation: Agree with the curriculum, but please consider the reader's comments.	
Opinion of external experts	Response to the opinion
For the main parts: - Are there specified branches for students to enroll in this curriculum, or students from all branches can enroll?	For the main parts: - It will be clarified in the complete version of the curriculum book that only the students from electrical engineering computer engineering and related fields can enroll in this curriculum.
- It is notable that there are a lot of special topic courses. The reader understand that they are prepared in case of new interesting topics exist. But on the other hand, there may be issues in controlling the course quality (because it is not specified in the course description in advance). Is it possible that students choose to study only special topics?	- The curriculum committees clarified that students can choose only special subjects for their elective courses. Based on curriculum requirement, an instructor who wants to open a special topic course must submit details of the course before the semester starts.

Name-Surname: Mr. Pattana Sangsrirote Position: Consultant of the Minister of Energy, Ministry of Energy Affiliation: Ministry of Energy Reader's Expertise: Industry and Graduates' Employer Overall Evaluation: Agree with the curriculum, but please consider the reader's comments.	
Comments from the reader	Response to the comments
Main the main parts: - Almost industry today such as telecommunications, information technology, automotive, energy, food, towards environmentally friendly energy or road to Net Zero, which focuses on RE integration including solar energy, wind energy, BESS, EV, as well as applications of big data to bring benefits as a whole. The university should consider or follow up on the implementation of various research to meet the needs of the industry in Thailand and respond to them. There should also be an assessment in this part. - The curriculum should support activities that can encourage Ph.D. students to do research while keeping pace with industry needs, such as internships in companies for various industries. The university should build cooperation, maybe through the government or alumni relationships or research/study exchanges with academic partners like other universities both domestically and internationally.	For the main parts: - The curriculum has considered to adjust the course contents in accordance with the current world trends, both in terms of renewable energy and the application of big data by attempting to include such topics in the curriculum as special topics courses. In addition, many of the lecturers in the course are experts in fields of interest to the world today, having served as consultants to the industrial sectors and government organizations as well. Therefore, we are confident that the curriculum can support teaching and research on topics that are trending or of interest to the world today. Examples of special topic courses are advanced artificial intelligence, deep learning, multimedia communications, image processing and computer vision, modern control, and adaptive control of power system. - Currently, the curriculum cooperates with leading universities from many countries including those in Europe, America and Australia. The details of the aforementioned cooperation will be further stated in the complete version of the curriculum book.

Appendix B1 Course Descriptions and Course Learning Outcomes

CPE 691 Research Methodology **2 (2-0-6)**
Pre-requisite: None

Introduction to Research Methodology, Explaining Behavior, Developing and Evaluating Theories of Behavior, Getting Ideas for Research, Choosing a Research Design, Making Systematic Observations, Choosing and Using Research Subjects, Understanding Ethical Issues in the Research Process, Using Non-experimental Research, Using Survey Research, Using Between-Subjects and Within-Subjects Experimental Designs, Using Specialized Research Designs, Using Single-Subject Designs, Describing Data, Using Inferential Statistics, Using Multivariate Design and Analysis, Reporting Your Research Results.

Learning Outcome: Able to describe the research process and the principle activities, skills and ethics associated with it. Construct an effective research proposal for their Ph.D. study.

CPE 710 Independent Study **3 (0-0-12)**
Pre-requisite: None

An in-depth study of an approved topic which will lead to formulation of dissertation proposal.

Learning Outcome: Able to conduct initial research and/or experiment on a research problem.

CPE 711 Electrical and Computer Engineering Seminar **1 (2-0-3)**
Prerequisite: None

Oral presentation in public on a research topic related to the dissertation or the progress of the dissertation.

Learning Outcome: Familiar with reading research papers and develop literature evaluation and research skills. Prepare for the Qualifying Examination.

CPE 790 Dissertation **48 (0-0-192)**
Prerequisite: None

Conduct an original research on a topic related to Electrical and/or Computer Engineering under the supervision and approval of the advisory committee.

Learning Outcome: Able to conduct advanced research with contribution to the global research community. Publish research findings in high ranking international journal(s) and conference proceedings.

CPE 791 Dissertation **60 (0-0-240)**
Prerequisite: None

Conduct an original research on a topic related to Electrical and/or Computer Engineering under the supervision and approval of the advisory committee.

Learning Outcome: Able to conduct advanced research with contribution to the global research community. Publish research findings in high ranking international journal(s) and conference proceedings.

CPE 600 Technical Research Writing **3 (3-0-9)**
Pre-requisite: None

Approaches and processes in conducting research in science and engineering. Ethical principles in research. Techniques for critical reviews of literatures. Finding research topics. Quantitative research methods. Research proposal development. Research project management. Writing techniques for technical and research articles.

Learning Outcome: Able to write academic papers and reviews in computer engineering fields using appropriate language. Knowledge of structure of technical writing**.**

CPE 610 Algorithm Analysis and Design **3 (3-0-9)**
Prerequisite: None

Roles of algorithms in computing. Growth of functions and algorithm complexity. Brute-force. Divide-and-conquer. Probabilistic analysis and randomized algorithms. Sorting algorithms. Dynamic programming. Greedy algorithms. Amortized analysis. Graph algorithms. Linear programming. String matching. Approximation algorithm. NP completeness.

Learning Outcome: Explain and analyze the worst-case time complexity of an algorithm. Compare and contrast the efficiency of algorithms using asymptotic complexity. Design efficient algorithms using standard algorithm design techniques. Apply standard algorithms to problems in computer science and engineering areas.

CPE 611 Queueing Theory **3 (3-0-9)**
Pre-requisite: None

Stochastic modeling techniques for analyzing the performance of computer systems, networks, and protocols. Markov chains and basic queuing theory. Non-Markovian queues. Generalized loss networks. Phase-type queues and the matrix-analytic methods. Fluid models. Bound and approximation techniques. Discrete-time queues.

Learning Outcome: Apply stochastic performance modeling methods to solve computer engineering problems.

CPE 612 Game Theory **3 (3-0-9)**
Pre-requisite: None

Fundamentals of game theory with an emphasis on applications for communication networks. Non-cooperative and cooperative game models for wireless access networks, resource allocation, power control, and quality of services. Analysis of the convergence properties of

games such as the existence, uniqueness and efficiency of the Nash equilibrium and designing efficient and robust distributed algorithms.

Learning Outcome: Explain the fundamentals of game theory Apply the game fundamentals and design a game model to solve a problem in wireless networking. Analyze the convergence properties of games for wireless networking.

CPE 613 Optimization Methods **3 (3-0-9)**
Prerequisite: None

Optimization design using mathematical modeling. Heuristic approach modeling to optimize the design of various system types including hardware systems, software systems, embedded systems, and network systems. Design constraints consideration includes system reliability, quality of services, and investment cost. Single-objective optimization, multi-objective optimization with evolutionary algorithms (MOEAs).

Learning Outcome: Apply appropriate techniques to solve single-objective and multi-objective optimization problems. Be able to work as a team with acceptable writing and presenting skills.

CPE 614 Applied Discrete Mathematics **3 (3-0-9)**
Prerequisite: None

Applications of discrete mathematics in formal method to analyze various computer hardware and software systems such as communication protocols, distributed systems, and algorithms. Proof techniques. Logic theory. Logic programming with PROLOG. Functional programming. Temporal logic. Model checking. Graph theory. Automata. Petri nets. Colored Petri Nets. and Process Algebra.

Learning Outcome: Identify computer development process and apply formal methods to create formal specification. Apply discrete mathematics to guide and verify the formal specification and the development of the system.

CPE 615 Experimental Design and Data Analysis **3 (3-0-9)**
Pre-requisite: None

Review of probability and random variables. Data collection methods. Graphical display of data. Exploratory data analysis. Correlation. Confidence interval. Hypothesis testing and decision errors. Regression models. Simple comparative experiments. Single factor experiments and analysis of variance. Factorial design. Multivariate analysis.

Learning Outcome: Design scientific experiments to collect data and analyze the data using standard statistical techniques. Be able to interpret meaningful results.

CPE 620 Data Mining **3 (3-0-9)**
Prerequisite: None

Concepts and methods for finding hidden and potentially useful information from small to huge amounts of data using various techniques. Association rule. Descriptive and predictive models. Classification. Statistics. Nearest neighbor. Clustering. Decision tree. Neural networks. Rule induction. Data warehousing. Data preparation. OLAP and information retrieval. Applications of data mining and advanced concepts.

Learning Outcome: Apply various techniques to solve data mining problems. Be able to work as a team with acceptable writing and presenting skills.

CPE 621 Data Visualization **1 (1-0-3)**
Prerequisite: None

Basic concepts of data visualization. Data types. MVC architecture in data visualization. Data model. Data preparation. Groups and sets. Table calculation. Trend analysis and forecast. Data blending. Related visualization tools such as Tableau, R, and D3. js. Case studies in data modeling and visualization.

Learning Outcome: Identify the principle of visualization. Design and create meaningful visualization that addresses the relevant problems. Use modern visualization tools to perform the visualization task.

CPE 622 Data Science for Business **2 (2-0-6)**
Prerequisite: None

Basis of data science**.** Data wrangling**.** Exploratory data analysis**.** Predictive modeling**.** Fitting model to the data**.** Similarity, neighbor, and clustering**.** Co**-**occurrence analysis**.** Data reduction**.** Data analytic thinking**.**

Learning Outcome: Identify basis of data science for data analytics**.** Analyze data to identify patterns in data using exploratory data analysis techniques**.** Create a predictive model in terms of both classification and regression**.** Analyze natural grouping in the data using clustering**.** Use co**-** occurrence analysis to create a recommendation system**.** Reduce the data dimension using PCA or MDS Use R and Tableau to analyze and create models from data**.**

CPE 623 Text Mining and Social Network Analysis **3 (3-0-9)**
Prerequisite: None

Basic multimedia information retrieval concepts. Management of data in various media forms, such as texts, audios, graphics and videos. Data structure used for storing, processing multimedia data. Various query techniques such as query-by-example, content-based query, semantic-based query. Integration of various types of data.

Learning Outcome: Apply information retrieval techniques to create a search engine. Modify algorithms in search engine for addressing specific problems.

CPE 624 Big Data **3 (3-0-9)**
Prerequisite: None

Bases of big data engineering and Hadoop ecosystem, visualization, structured and unstructured databases and data services with Hive and HBase. HDFS and MapReduce. Workload management (YARN). In-memory process with Spark. Data integration through Flume and Sqoop. Solr search engine. Emphasize on aspect of system and architecture as well as programming frameworks.

Learning Outcome: Analysis the basic concepts of big data technology and Hadoop ecosystem. Learn how to program on the Hadoop ecosystem (interactive and batch modes). Learn to integrate data from multiple sources into a single point of view and query the data through applications.

CPE 625 High Performance and Cloud Computing **3 (3-0-9)**
Prerequisite: None

Fundamental methods by which parallel programs are assembled. Important concepts for program design. Partitioning. Mapping. Granularity. Applications to multiple high performance computing platforms. Alternative programming paradigms including MapReduce, GPU's CUDA. Fundamental of cloud services PaaS, IaaS, and SaaS, the architecture of the cloud, and the concept and practice of virtualization.

Learning Outcome: Analysis architecture of the high performance computing systems and virtualized networked systems. Analyze system efficiency. Design and implement program on the high performance computing system.

CPE 630 Computer Aided Geometric Design **3 (3-0-9)**
Prerequisite: None

Foundations of geometric modeling. Concepts and mathematic theory of curve and surface modeling. Bézier, Said-Ball, Wang-Ball, DP and B-Spline curves, and their geometric properties. Algorithms for computing a point on these curves for both polynomial (non-rational) and rational ones. Relationships among those curves defined and proven by the polar form approach. Degree elevation and degree reduction. Rectangular surfaces and triangular patches.

Learning Outcome: Able to apply concepts and techniques of computer aided geometric design algorithms.

CPE 631 Advanced Geometric Modeling **3 (3-0-9)**
Prerequisite: CPE 630 or CPE 631

Advanced techniques in geometric modeling. Concepts and mathematical theory of curve, surface and solid modeling. Algorithms and applications related to the various types of application systems in geometric modeling.

Learning Outcome: Able to apply concepts and techniques of advanced geometric modeling algorithms.

CPE 632 Human Computer Interaction 3 (3-0-9)
Pre-requisite: None

Theory and practice of effective user interface design. Interaction design, implementation, and evaluation. Theories behind successful human-computer interaction. Awareness of established procedures for good user interface design. Usability engineering process. Novel interface designs.

Learning Outcome: Apply knowledge and skill in human-computer interaction in the design or evaluate of computer systems. Research for new information and concept to use in the design, Team working in multidisciplinary and culturally diverse environments. Be able to read, write and communicate efficiently in English.

CPE 633 Digital Watermarking for Multimedia Content 3 (3-0-9)
Prerequisite: None

Introduction to digital image processing. Image and MATLAB. Image display. Point processing. Neighborhood processing. Image geometry. Fourier transform. Color models. Color processing. Image Coding & compression. Cryptography for watermark security. Digital watermarking fundamentals. Watermarking evaluation. Image watermarking techniques. Attacks on digital watermarks. Video coding concept. Watermarking a video sequence. Spatial domain based image watermarking for digital networks and its improving methods. Frequency domain based image watermarking for social networks. Document watermarking against printing and scanning attacks. Digital watermarking for camera-captured image.

Learning Outcome: Able to add a watermark signal into a digital image for copyright protection purpose using the digital image processing and cryptographic techniques learned in the class. Be able to start doing research in image watermarking area.

CPE 634 Digital Educational Game Design 3 (3-0-9)
Prerequisite: None

Foundations of digital game design. Concepts and mathematic theory of digital game design Digital educational game design and development life cycle. Game classification. Introduction to practical concepts of game and its components including Natural funativity theory, Maslow's hierarchy of needs. Game Mechanic, Dynamic and Aesthetic. Storytelling. Character design. Scene design. Level design. Game flow and difficulty. Outcome-Based Learning Theory. Game Design Document.

Learning Outcome: Apply concepts and techniques of digital game. Explain the basic principles of digital game design. Evaluate, select and implement appropriate procedures to efficiently develop fun games.

CPE 640 Artificial Intelligence 3 (3-0-9)
Prerequisite: None

State-of-the-art topics in artificial intelligence fields. Hands-on experiences in implementation of several AI applications, such as intelligent agents. Problem-solving and searching for

solutions. Uninformed search, heuristic search, game search, constraint satisfaction problems. Theorem proving, propositional calculus, first order logic, inference with clauses, resolution. Classical planning, deterministic planning, STRIPS planning. Knowledge representation, inference rules, semantics, semantic nets, frame-based. Bayesian inference, Bayesian networks, HMMs, making decision, planning in stochastic domains.

Learning Outcome: Apply techniques of AI to design and implement an intelligent system with students' own fields of interest.

CPE 641 Natural Language Processing **3 (3-0-9)**
Prerequisite: None

Natural language processing and its application. Structural analysis of natural languages. Semantic interpretation. Grammar writing for computer to build parsers for various languages. Review of current natural language processing systems.

Learning Outcome: Apply knowledge and skills in natural language processing tasks, research various issues in language processing and language understanding, function and manage in team work, be able to read, write, and communicate efficiently in English.

CPE 642 Speech Processing **3 (3-0-9)**
Prerequisite: None

Bases of speech processing. Computer sound system and digital audio. Human speech production and perception. Speech recognition concepts including, spectral analysis, spectral feature, language model, and hidden Markov model. Speech synthesis concepts including, concatenative synthesis, phonetics, and prosody.

Learning Outcome: Identify the basis of speech processing. Create simple speech recognition, synthesis and spoken dialog systems. Customize the existing speech processing systems for performing specific tasks.

CPE 643 Applied Machine Learning **3 (3-0-9)**
Pre-requisite: CPE 640

Hands-on experiences in implementation of several advance topics in machine learning field. Unsupervised learning. Self-organizing maps. Inductive learning. Reinforcement learning. Artificial neural networks. Stochastic neural networks. Convolutional networks. Deep learning. Genetic programming and robotics.

Learning Outcome: Apply machine learning techniques to solve several machine learning problems. Able to work as a team with acceptable writing and presenting skills.

CPE 650 Software Engineering **3 (3-0-9)**
Prerequisite: None

Introduction to the goals and practices of software engineering. Independent literature research and reporting on current topics and issues in software engineering research. New tools and paradigms for specification, design, implementation and testing. New programming

paradigms. Model checking. Executable designs. Design for evolution, automation of test generation and execution.

Learning Outcome: Identify and explain the core objectives of software engineering. Identify and elaborate on major questions in current software engineering research. Summarize and critique a software engineering research article. Design a research project to investigate an important issue in software engineering research.

CPE 651 Multimedia Information Retrieval 3 (3-0-9)
Prerequisite: None

Basic concepts of information retrieval and specific applications such as search engine. Text and multimedia representations. Similarity measurements. Information retrieval architecture and techniques in indexing, compressing, ranking, categorization, and feature selection. Implementation of search engine. Extracting features through querying. Evaluation of search engine results with standard methods. Internet retrieval using data from web clawer from online websites.

Learning Outcome: Identify basic concepts of multimedia information retrieval. Know various methods in extracting features, calculate similarity, index data, compress data, select features, and evaluate results. Also, build a search engine from corpus or multimedia database.

CPE 652 Bio-inspired Computing 3 (3-0-9)
Prerequisite: None

Characteristics of Natural Systems, Cellular Automata, Evolutionary Algorithms, Genetic Algorithms, Genetic Programming, Swarm Intelligence, Particle Swarm Optimization, Ant Colony Optimization, Artificial Bee Colony, Artificial Neural Networks, Quantum Computing

Learning Outcome: Identify inspiration, motivation, and computation behind bioinspired computing models. Apply computing models to solve problems. Survey and explore more lituratures.

CPE 653 Digital Image Processing and Analysis 3 (3-0-9)
Prerequisite: None

To introduce the fundamental concepts of image processing and common analytical methods. Students is exposed with image enhancement and restoration techniques. To understand image compression techniques, segmentation, and morphological processing techniques.

Learning Outcome: Explain fundamental concepts of image processing. Able to apply common analytical methods on images, and evaluate the techniques for image enhancement and image restoration. Explain compression, segmentation, and morphological.

CPE 654 Brain-Computer Interface 3 (3-0-9)
Pre-requisite: None

Understand concepts of BCI and its history. Explore interface techniques of partial invasive and non-invasive. Students can acquire EEG signal and pre-process it. Apply signal processing

to brain signal e.g., spatial, temporal, spectral, spatio-temporal filters. Apply feature extraction and build Machine Learning models on brain signal.

Learning Outcome: Identify different types of BCI signals from various instruments. Able to capture brain signal and apply suitable preprocesses techniques. Process brain signal, extract feature, and build machine learning models.

CPE 655 Data Security for Multimedia Communications 3 (3-0-9)
Pre-requisite: None

Reviews on symmetrical and asymmetrical encryption algorithms, hash function, MAC, digital signature. Various cryptographic techniques, Implementations: protecting the integrity of a sequence of images, key distribution scheme for one-way broadcasting, hiding cipher text by cascading algorithms. Speech security systems. Principle of image compression & JPEG compression standard. Principle of video compression & MPEG compression standard. Selective encryption. Reduced complexity encryption. Copyright protection technologies based on digital watermarking techniques. Digital watermarking based on modification of image pixels & modification of DWT coefficients. Fingerprinting schemes in communication systems. Secure distribution of copyright data.

Learning Outcome: Identify security problems in a practical system, analyze and design solution for such problems. Be able to start doing research in data security area.

CPE 795 Special Topic 3 (3-0-9)

EEE 795 Special Topic 3 (3-0-9)

ENE 795 Special Topic 3 (3-0-9)

INC 795 Special Topic 3 (3-0-9)

These four graduate elective courses are provided by the four-joined department (CPE, EEE, ENE and INC)

Pre-requisite: None

Learning Outcome: Identify knowledge in a certain subject field and able to apply the knowledge in his/her research. Able to analyze and solve problem reasonably with fairness; good moral and ethical.

Appendix B2 Table Showing the Comparison of the Old and the Revised Programmes

Original Programme (2017)		Revised Programme (2022)		Remark
Total credits in the programme Plan A1 applicants who earned master degree Plan B1 applicants who earned master degree Plan B2 applicants who only earned bachelor degree	 48 credits 48 credits 75 credits	**Total credits in the programme** Plan A1 applicants who already earned master degree Plan B1 applicants who already earned master degree Plan B2 applicants who only earned bachelor degree	 48 credits 48 credits 75 credits	- No change
Programme Structure Plan A1 applicants who earned master degree Dissertation Plan B1 applicants who earned master degree Core Courses Elective Courses Dissertation Plan B2 applicants who only earned bachelor degree Core Courses Elective Courses Dissertation	 48 credits 6 credits 6 credits 36 credits 6 credits 21 credits 48 credits	**Programme Structure** Plan A1 applicants who earned master degree Dissertation Plan B1 applicants who earned master degree Core Courses Elective Courses Dissertation Plan B2 applicants who only earned bachelor degree Core Courses Elective Courses Dissertation	 48 credits 6 credits 6 credits 36 credits 6 credits 21 credits 48 credits	Plan A1: no change in required course credits. Plan B1: no change in required course credits. Plan B2: no change in required course credits.
Core Courses CPE 691 Research Methodology CPE 710 Independent Study CPE 711 Electrical and Computer Engineering Seminar	**6 credits** 2 credits 3 credits 1 credit	**Core Course** CPE 691 Research Methodology CPE 710 Independent Study CPE 711 Electrical and Computer Engineering Seminar	**6 credits** 2 credits 3 credits 1 credit	- No change
Elective Courses	**6 /21 credits**	**Elective Courses**	**6 /21 credits**	
CPE 600 Technical Research Writing	3 (3-0-9)	CPE 600 Technical Research Writing	3 (3-0-9)	- Update and revise the contents.
CPE 601 Experimental Design and Data Analysis	3 (3-0-9)	CPE 615 Experimental Design and Data Analysis	3 (3-0-9)	
CPE 610 Algorithm Analysis and Design	3 (3-0-9)	CPE 610 Algorithm Analysis and Design	3 (3-0-9)	
CPE 611 Queuing Theory	3 (3-0-9)	CPE 611 Queuing Theory	3 (3-0-9)	

Original Programme (2017)		Revised Programme (2022)		Remark
CPE 612 Game Theory	3 (3-0-9)	CPE 612 Game Theory	3 (3-0-9)	
CPE 613 Optimization Methods	3 (3-0-9)	CPE 613 Optimization Methods	3 (3-0-9)	- Update and revise the contents.
CPE 614 Applied Discrete Mathematics and Formal Methods	3 (3-0-9)	CPE 614 Applied Discrete Mathematics	3 (3-0-9)	
CPE 620 Data Mining	3 (3-0-9)	CPE 620 Data Mining	3 (3-0-9)	
none	-	CPE 621 Data Visualization	1 (1-0-3)	- Adding CPE 621 and CPE 622 courses from CPE M.S. programme
none	-	CPE 622 Deta Science for Business	2 (2-0-6)	
CPE 623 Information Retrieval and Text Mining	3 (3-0-9)	CPE 623 Text Mining and Social Network Analysis	3 (3-0-9)	
CPE 624 Big Data	3 (3-0-9)	CPE 624 Big Data	3 (3-0-9)	
CPE 625 High Performance and Cloud Computing	3 (3-0-9)	CPE 625 High Performance and Cloud Computing	3 (3-0-9)	
CPE 630 Computer Aided Geometric Design	3 (3-0-9)	CPE 630 Computer Aided Geometric Design	3 (3-0-9)	
CPE 631 Advanced Geometric Modeling	3 (3-0-9)	CPE 631 Advanced Geometric Modeling	3 (3-0-9)	
CPE 632 Human Computer Interaction	3 (3-0-9)	CPE 632 Human Computer Interaction	3 (3-0-9)	
CPE 633 Digital Watermarking for Multimedia Content	3 (3-0-9)	CPE 633 Digital Watermarking for Multimedia Content	3 (3-0-9)	
none	-	CPE 634 Digital Educational Game Design	3 (3-0-9)	- Adding a new course CPE 634
CPE 640 Artificial Intelligence	3 (3-0-9)	CPE 640 Artificial Intelligence	3 (3-0-9)	
CPE 641 Natural Language Processing	3 (3-0-9)	CPE 641 Natural Language Processing	3 (3-0-9)	
CPE 642 Speech Processing	3 (3-0-9)	CPE 642 Speech Processing	3 (3-0-9)	
CPE 643 Applied Machine Learning	3 (3-0-9)	CPE 643 Applied Machine Learning	3 (3-0-9)	
CPE 650 Software Engineering	3 (3-0-9)	CPE 650 Software Engineering	3 (3-0-9)	

Original Programme (2017)		Revised Programme (2022)		Remark
CPE 651 Multimedia Information Retrieval	3 (3-0-9)	CPE 651 Multimedia Information Retrieval	3 (3-0-9)	- CPE652 subject is now changed to Bio-inspired Computing, which is a modern/hot topic. The old subject is removed. - CPE 653 and CPE654 are now replaced with modern subjects. The old subjects are removed.
CPE 652 Algorithms and Architectures for Geoinformatics	3 (3-0-9)	CPE 652 Bio-inspired Computing	3 (3-0-9)	
CPE 653 GPU Computing	3 (3-0-9)	CPE 653 Digital Image Processing and Analysis	3 (3-0-9)	
CPE 654 System Administration	3 (3-0-9)	CPE 654 Brain-Computer Interface	3 (3-0-9)	
CPE 655 Data Security for Multimedia Communications	3 (3-0-9)	CPE 655 Data Security for Multimedia Communications	3 (3-0-9)	
CPE 795 – 798 Special Topics I - IV	3 (3-0-9)	CPE 795 Special Topic	3 (3-0-9)	- Reduce number of special topic courses
EEE 795 – 798 Special Topics I - IV	3 (3-0-9)	EEE 795 Special Topic	3 (3-0-9)	
ENE 795 – 798 Special Topics I - IV	3 (3-0-9)	ENE 795 Special Topic	3 (3-0-9)	
INC 795 – 798 Special Topics I - IV	3 (3-0-9)	INC 795 Special Topic	3 (3-0-9)	
		These elective courses are graduate courses offered by the four departments which are Computer Engineering, Electrical Engineering, Electronic and Telecommunication Engineering, and Control System and Instrumentation Engineering. Examples of special topics are advanced artificial intelligence, deep learning, multimedia communications, image processing and computer vision, modern control, and adaptive control of power system.		
Dissertation CPE 790 Dissertation CPE 791 Dissertation	**36/ 48 credits** 36 credits 48 credits	**Dissertation** CPE 790 Dissertation CPE 791 Dissertation	**36/ 48 credits** 36 Credits 48 Credits	- No change

Appendix C Details of the Lecturers In-Charge of the Programme, Full-time Lecturers, and Guest Lecturers

Assoc.Prof. Dr. Naruemon Wattanapongsakorn

รศ.ดร. นฤมล วัฒนพงศกร

1. Academic Background

2000 Ph.D. (Electrical Engineering), University of Pittsburgh, U.S.A.

1995 M.Eng. (Electrical Engineering), George Washington University, U.S.A.

1994 B.Eng. (Computer Engineering), George Washington University, U.S.A.

2. Teaching Course

2.1 Current Teaching Courses

Undergraduate Courses

CPE 121 Discrete Mathematics for Computer Engineers	3 Credits
CPE 341 Optimization Design and Reliability Engineering	3 Credits
CPE 452 Data Mining	3 Credits

Graduate Courses

CPE 613 Optimization Methods	3 Credits
CPE 654 Data Mining	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 613 Optimization Methods	3 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Choachaicharoenkul, S. and Wattanapongsakorn, N. (2020). "Post Pareto-optimal ranking algorithm for multi-objective optimization using extended angle dominance", *Inter Journal of Expert Systems with Applications.* Vol. 158, 15 November 2020, Article Number 113446.
   In this database: Scopus, Web of Science.
2. Alzahrani, S. M. and Wattanapongsakorn, N. (2018). "Comparative Study of Knee-Based Algorithms for Many-Objective Optimization Problems", *ECTI-Transactions on Computer and Information Technology*. Vol. 12, No. 1, pp. 7-16.
   In this database: Scopus.

International Conference (weight value 0.4)

1. Mangalmurti, Y. and Wattanapongsakorn, N. (2021). "COVID-19 and Other Lung Disease Detection using VGG19 Pretrained Features and Support Vector Machine", *International Computer Science and Engineering Conference (ICSEC)*. November 18-20, Chiang Rai, Thailand, pp. 1-6.
2. Chatchaiwatkul, A., Phonsuphee, P., Mangalmurti, Y. and Wattanapongsakorn, N. (2021). "Lung Disease Detection and Classification with Deep Learning Approach", *International Technical Conference of Circuits/Systems, Computers and Communications (ITC-CSCC 2021)*. May 28-30, Jeju, Korea, pp. 1-4.
3. Choachaicharoenkul, S. and Wattanapongsakorn, N. (2020). "Finding Outstanding Solutions for Multi-objective Optimization Problems", *The 12th International Conference on Computer and Automation Engineering (ICCAE),* March 2020, Sydney, Australia, pp. 18-22.
4. Thungrut, W. and Wattanapongsakorn, N. (2018). "Diabetes Classification with Fuzzy Genetic Algorithm", *International Conference on Computing and Information Technology (IC2IT 2018): Recent Advances in Information and Communication Technology 2018*. Part of the Advances in Intelligent Systems and Computing book series (AISC, volume 769), October 6, Chaing Mai, Thailand, pp. 107-114.

Asst. Prof. Dr. Sumate Naetiladdanon

ผศ.ดร. สุเมธ เนติลัดดานนท์

1. Acedemic Background

2006 Ph.D. (Electrical Engineering), Osaka University, Japan

1998 M.S. (Electric Power Engineering), Rensselaer Polytechnic Institute, U.S.A.

1995 B.Eng. (Electrical Engineering), Chulalongkorn University, Thailand

2. Teaching Courses

2.1 Current Teaching Courses

Graduate Courses

EEE 606	Thesis	3 Credits
EEE 630	Power Quality	3 Credits

Undergraduate Courses

EEE 397	Seminar and Electrical Engineering Mini Project	1 Credit
EEE 435	Renewable Energy	3 Credits
EEE 498	Electrical Engineering Project Study	1 Credit
EEE 499	Electrical Engineering Project	3 Credits

2.2 Teaching Courses in this Curriculum

Graduate Courses

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Gurung, S., Jurado, F., Naetiladdanon, S. and Sangswang, A. (2020). "Comparative Analysis of Probabilistic and Deterministic Optimization Methods to Tune the Power

System Stabilizers for Enhancement of System Small-Signal Stability", *Electric Power Systems Research* Vol. 181, No. 1, pp. 1-10.
In this database: Scopus, Web of Science

2. Gurung, S., Jurado, F., Naetiladdanon, S. and Sangswang, A. (2019). "Optimized tuning of power oscillation damping controllers using probabilistic approach to enhance small-signal stability conside.ing stochastic time delay", *Electrical Engineering*. Vol. 101, No.1, pp. 969–982.
In this database: Scopus, Web of Science
3. Kranprakon, P., Sangswang, A. and Naetiladdanon, S. (2019). "ZVS-Operation of LLC Resonant Inverter with Phase Limit Control for Induction furnace," *ECTI Transactions on Computer and Information Technology*. Vol. 13, No. 1, pp. 29-36.
In this database: Scopus

International Conference (weight value 0.4)

1. Voottipruex, K., Mujjalinvimut, E., Sangswang, A. and Naetiladdanon, S. (2020). "A Load-Independent Operation of WPT under Frequency Bifurcation for Battery Charging Applications", *IECON 2020 The 46th Annual Conference of the IEEE Industrial Electronics Society*, Singapore, pp. 2573-2578.
2. Kongbuntud, K., Naetiladdanon, S., Pattanapakdee, K., Apainipat, C. and Bstieler, C. (2019). "Hybrid White LED Street Light for Mesopic Vision", *The 29th Quadrennial Session of the International Commission on Illumination (CIE 2019).* 14-22 June, Washington D.C., U.S., pp. 958-961.
3. Nutwong, S., Saengswang, A., Naetiladdanon, S. and Mujjalinvimut, E. (2018). "Comparative Study of IPT Multi-Transmitter Coils Single-Receiver Coil System Focusing on Misalignment Tolerance and System Efficiency", *21st International Conference on Electrical Machines and Systems (21st-ICEMS).* 7-10 October, Ramada Plaze Jeju Hotel, Korea, pp. 817-821.

Asst. Prof. Dr. Werapon Chiracharit

ผศ.ดร. วีรพล จิรจริต

1. Academic Background

2007 Ph.D. (Electrical and Computer Engineering), King Mongkut's University of Technology Thonburi, Thailand

2001 M.Eng. (Electrical Engineering), King Mongkut's University of Technology Thonburi, Thailand

1999 B.Eng. (Electronic and Telecommunication Engineering), King Mongkut's University of Technology Thonburi, Thailand

2. Teaching Course

2.1 Current Teaching Courses

Graduate Courses

EIE 600	Advanced Mathematics for Electrical and Information Engineering	3 Credits
ENE 562	Image Processing and Computer Vision	3 Credits

Undergraduate Courses

EIE 240	Electrical and Electronic Measurement	3 Credits
EIE 461	Introduction to Digital Image Processing	3 Credits
ENE 103	Electrotechnology I (Electronics)	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790	Dissertation	36 credits
CPE 791	Dissertation	48 credits

3 .Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Trongtirakul, T., Chiracharit, W. and Agaian, S. (2020). “Single Backlit Image Enhancement”, *IEEE Access*, Vol. 8, No. 1, pp. 71940-71950.
   In this database: Web of Science
2. Trongtirakul, T., Chiracharit, W., Imberman, S. and Agaian, S. (2019). “Fractional Contrast Stretching for Image Enhancement of Aerials and Satellite Images”, *Journal of Imaging Science and Technology*, Vol. 63, No. 6, pp. 60411-1 - 60411-11.
   In this database: Scopus
3. Techawatcharapaikul, C., Mittrapiyanuruk, P., Kaewtrakulpong, P., Siddhichai, S. and Chiracharit, W. (2018). “Improved Radiometric Calibration by Brightness Transfer Function Based Noise & Outlier Removal and Weighted Least Square Minimization”, *IEICE Trans. on Information and Systems*, Vol. E101-D, No. 8, pp. 2101-2114.
   In this database: Scopus

International Conference (weight value 0.4)

1. Techawatcharapaikul, C., Mittrapiyanurak, P. and Chiracharit, W. (2019). “Sufficient Simple in-Camera Imaging Processing Pipeline for RAW-Images and sRGB Images”, *The International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology.* 10-13 July 2019, Pattaya, Chonburi, Thailand, pp. 630-633.
2. Techawatcharapaikul, C., Mittrapiyanurak, P. and Chiracharit, W. (2019). “Improved Weighted Least Square Radiometric Calibration Based Noise and Outlier Rejection by Adjacent Comparagraph and Brightness Transfer Function”, *The 2019b International Conference on Computing and Information Technology*. 12 May 2019, Thailand, pp. 46-55.
3. Trongtirakul, T., Ladyzhensky, D., Chiracharit W. and Agaian, S. (2019). “Non-linear Contrast Stretching with Optimizations”, *SPIE Defense + Commercial Sensing*. 13 May 2019, Thailand, pp. 1099303-1 - 1099303-12.

Dr. Tanagorn Jennawasin

ดร.ธนกร เจณณวาสิน

1. Academic Background

2008 Ph.D. (Information Science and Technology), The University of Tokyo, Japan

2005 M.Sc. (Information Science and Technology), The University of Tokyo, Japan

2001 B.Eng. (Electrical Engineering), Chulalongkorn University, Thailand (2544 B.E.)

2. Teaching Course

2.1 Current Teaching Courses

- Postgraduate courses

EEE	602	Advances in Electrical Engineering	3	Credits
INC	691	Computational Technique for Engineers	3	Credits
INC	604	Seminar	1	Credit
INC	605	Thesis	12	Credits

- Undergraduate courses

INC	102	Fundamental of Instrumentation and Process Control	3	Credits
INC	241	Computational Techniques for Engineering	3	Credits
INC	331	Control System Design	3	Credits
INC	351	Basic Engineering Statistics and Quality Control	3	Credits
INC	352	Industrial Process Measurement	3	Credits
INC	473	Working Integrated Learning I: Project	6	Credits
INC	475	Control and Instrumentation Engineering Project	3	Credits
INC	476	Automation Engineering Project	3	Credits

2.2 Teaching Courses in this Curriculum

CPE 790	Dissertation	48 Credits
CPE 791	Dissertation	60 Credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Jennawasin, T. and Banjerdpongchai, D. (2021). “Iterative LMI Approach to Robust Static Output Feedback Control of Uncertain Polynomial Systems with Bounded Actuators”, *Automatica,* (Vol.123), Article Number 109292.
   In this database: Scopus, Web of Science
2. Jennawasin, T., Lin, C.-L. and Banjerdpongchai, D. (2020). “Parameter-dependent Linear Matrix Inequality Approach to Robust State Estimation of Noisy Genetic Networks”, *Computers & Chemical Engineering*, Vol. 136, Article Number 106811.
   In this database: Scopus, Web of Science
3. Jennawasin, T., Banjerdpongchai, D., Narikiyo, T., and Kawanishi, M. (2019). “Iterative LMI Approach to Robust State-feedback Control of Polynomial Systems with Bounded Actuators*”, International Journal of Control, Automation and Systems*, Vol. 17, No. 4, pp. 847-856
   In this database: Scopus, Web of Science
4. Jennawasin, T., and Banjerdpongchai, D. (2018). “Design of State-Feedback Control for Polynomial Systems with Quadratic Performance Criterion and Control Input Constraints”, *Systems & Control Letters*, Vol. 117, No. 2, pp. 53-59. In this database: Scopus, Web of Science

International Conference (weight value 0.4)

1. Jennawasin, T., and Banjerdpongchai, D. (2019). “Robust Output-Feedback Stabilization of a Nonlinear Bioreactor :A Matrix Inequality Approach”, *International Conference on Control, Automation and Systems*, 15-18 October, Jeju, Korea, pp .1268-1273 .

Prof. Dr. Booncharoen Sirinaovakul

ศ. ดร. บุญเจริญ ศิริเนาวกุล

1. Academic Background

1995	D.Eng. (Computer Engineering), King Mongkut's University of Technology Ladkrabang, Thailand (2538 B.E.)
1987	M.Sc. (Computer Science), The Wichita State University, U.S.A.
1983	B.Eng. (Electrical Engineering), King Mongkut's University of Technology Ladkrabang, Thailand (2526 B.E.)

2. Teaching Courses

2.1 Current Teaching Courses

Graduate Courses

CPE 790	Dissertation	36 Credits
CPE 791	Dissertation	36 credits

2.2 Teaching Courses in this Curriculum

CPE 790	Dissertation	36 credits
CPE 791	Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.3 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Fairee, S., Khompatraporn, Ch., Sirinaovakul, B. and Prom-on, S. (2020). "Trim Loss Optimization in Paper Production using Reinforcement Artificial Bee Colony", *IEEE Access*, Vol. 8, pp. 130647-130660. DOI: 10.1109/ACCESS.2020.3008922. In this database: Web of Science
2. Taetragool, U., Sirinaovakul, B., Achalakul, T. (2018). "NeSS: A Modified Artificial Bee Colony Approach Based on Nest Site Selection Behavior", *Applied Soft Computing*, Vol. 71, pp. 659-671.

In this database: Web of Science

3. Fairee, S., Prom-On, S., Sirinaovakul, B. (2018). “Reinforcement Learning for Solution Updating in Artificial Bee Colony”, *PLoS ONE.* 13(7), Article Number e0200738.
   In this database: Web of Science
4. Ratanasanya, S., Chindapan, N., Polvichai, J., Sirinaovakul, B., Devahastin, S. (2018). “Particle Swarm Optimization as Alternative Tool to Sensory Evaluation to Produce High-quality Low-Sodium Fish Sauce via Electrodialysis”, *Journal of Food Engineering,* Vol. 228, pp. 84-90.
   In this database: Web of Science

Prof. Dr. Kosin Chamnongthai

ศ.ดร. โกสินทร์ จำนงไทย

1. Academic Background

1991 D.E.E (Electrical Engineering), Keio University, Japan

1987 M.E.E. (Electrical Engineering), Nippon Institute of Technology, Japan

1985 B.E.E. (Electronic Engineering), The University of Electro-Communication, Japan

2. Teaching Course

2.1 Current Teaching Courses

Undergraduate Courses

ENE/EIE 370 Seminar	1 Credit
ENE/EIE 477 Electrical Communication and Electronic Engineering Project I	1 Credit
ENE/EIE 478 Electrical Communication and Electronic Engineering Project II	2 Credits

Graduate Courses

EEE 503 Research Methodology	3 Credits
EIE 503 Research Methodology (Thai & English)	3 Credits
EIE 603 Research Methodology and Paper Writing	3 Credits
EIE 641 Image Processing and Computer Vision (Thai & English)	3 Credits
EIE 701 Thesis	12 Credits
EIE 702 Research Study	6 Credits

2.2 Teaching Courses in this Curriculum

ENE 795 Special Topic Image Processing and Computer Vision	3 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.4 Qualification and filed of study corresponds with the program’s field of study

3.5 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Yeamkuan, S. and Chamnongthai, K. (2021). “3D Point-of-Intention Determination Using a Multimodal Fusion of Hand Pointing and Eye Gaze for a 3D Display”, *SENSORS,* Vol. 21, pp. 1-31.
   In this database: Scopus, Web of Science
2. Chophuk, P. and Chamnongthai, K. (2021). “Backhand-View-Based Continuous-Signed-Letter Recognition Using a Rewound Video Sequence and the Previous Signed-Letter Information”, *IEEE ACCESS*, Vol. 9, pp. 40187-40197.
   In this database: Scopus, Web of Science
3. Boonthep, N. and Chamnongthai, K. (2020). “A Method of Motion-Estimation-Based H.264 Video Coding Using Optimal Search-Range”, *WIRELLESS PERSONAL COMMUNICATIONS,* Vol. 115, pp. 2833-2850.
   In this database: Scopus, Web of Science
4. Boonthep, N., Chamnongthai, K. and Phensadsaeng, P. (2020). “H.264 Video Coding-Based Motion Estimation Architecture for Video Broadcasting from a Studio”, *WIRELLESS PERSONAL COMMUNICATIONS*, Vol. 115, pp. 2851-2874.
   In this database: Scopus, Web of Science
5. Pichitwong, W. and Chamnongthai, K. (2019). “An Eye-Tracker-Based 3D Point-of-Gaze Estimation Method Using Head Movement”, *IEEE ACCESS*, Vol. 7, No. 2, pp. 99086-99098.
   In this database: Scopus, Web of Science
6. Laosai, J. and Chamnongthai, K. (2018). “Classification of Acute Leukemia Using Medical-Knowledge-Based Morphology and CD Marker”, *Biomedical Signal Processing and Control*, Vol. 44, No. 2, pp. 127-137.
   In this database: Scopus, Web of Science
7. Turmchokkasam, S. and Chamnongthai, K. (2018). “The Design and Implementation of an Ingredient-Based Food Calorie Estimation System Using

Nutrition Knowledge and Fusion of Brightness and Heat Information", *IEEE ACCESS*, Vol. 6, No. 1, pp. 46863-46876.
In this database: Scopus, Web of Science

8. Petpairote, C., Madarasmi, S. and Chamnongthai, K. (2018). "Personalised-Face Neutralisation Using Best-Matched Face Shape with a Neutral-Face Database", *IET Computer Vision*, Vol. 12, No. 3, pp. 252-260.
In this database: Scopus
9. Petpairote, C., Madarasmi, S. and Chamnongthai, K. (2018). "System for Face Recognition Under Expression Variations of Neutral-Sampled Individuals Using Recognized Expression Warping and a Virtual Expression-Face Database", *Journal of Electronic Imaging*, Vol. 27, No. 1, pp. 1002-1015.
In this database: Scopus

Assoc.Prof.Dr. Thumrongrat Amornraksa

รศ.ดร. ธำรงรัตน์ อมรรักษา

1. Academic Background

1999 Ph.D. (Electronic and Electrical Engineering), University of Surrey, U.K.

1996 M.S. (Electronic and Electrical Engineering), University of Surrey, U.K.

1995 B.Eng. (Electrical Engineering), King Mongkut's University of Technology North Bangkok, Thailand

2. Teaching

2.1 Current Teaching Courses

Undergraduate Courses

CPE 314 Computer Networks	3 Credits
CPE 341 Computer Networks	3 Credits
CPE 381 Data Security for Multimedia Communications	3 Credits
CPE 464 Digital Image Processing for Copyright Protection	3 Credits

Graduate Courses

CPE 602 Computer Engineering Seminar	1 Credits
CPE 633 Digital Watermarking for Multimedia Content	3 Credits
CPE 655 Data Security for Multimedia Communications	3 Credits
CPE 691 Research Methodology	2 Credits
CPE 711 Electrical and Computer Engineering Seminar	1 Credit

2.2 Teaching Courses in this Curriculum

CPE 633 Digital Watermarking for Multimedia Content	3 Credits
CPE 655 Data Security for Multimedia Communications	3 Credits
CPE 711 Electrical and Computer Engineering Seminar	1 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal

1. Chotikawanid, P. and Amornraksa, T. (2021). "Color Image Watermarking Based on Reflectance Component Modification and Guided Image Filtering", *Multimedia Tools and Application*, 80(18), May 2021, pp. 27615-27648.
   In this database: Scopus, Web of Science
2. Thongkor, K., Amornraksa, T. and Delp, E.J. (2018). "Digital Watermarking for Camera-captured Images based on Just Noticeable Distortion and Wiener Filtering", *Journal of Visual Communication and Image Representation.* Vol. 53, May 2018, pp. 146-160.
   In this database: Scopus, Web of Science

International Conference (weight value 0.4)

1. Chotikawanid, P. and Amornraksa, T. (2019). "Robust and Invisible Image Watermarking for Presentation Slides in E-Learning", *Proc. of ICBDE 2019*, March 30 - April 1, London, England, pp. 31-36.
2. Pramoun, T., Srakaew, S. and Amornraksa, T. (2019). "Image Watermarking based on Modified Harmonic Mean Filter", *ADIP 2019*, December 21-23, Kobe, Japan, pp. 97-103.
3. Chotikawanid, P., Pramoun, T., Supasirisun, P. and Amornraksa, T. (2018). "Image Watermarking Against Vintage and Retro Photo Effects", *Proc. of the 14th International Conference on Computing and Information Technology (IC2IT 2018),* Chiang Mai, Thailand, July 5-6, Advances in Intelligent Systems and Computing Volume 769, Series editor-Janusz Kacprzyk, Springer International Publishing AG, pp.167-176.
4. Ula, K.M.S., Pramoun, T., Toomnark, S. and Amornraksa, T. (2018). "Digital Image Watermarking Based on Fuzzy Image Filter", *Proc. of the 14th International Conference on Computing and Information Technology (IC2IT 2018),* July 5-6,

Advances in Intelligent Systems and Computing Volume 769, Series editor-Janusz Kacprzyk,, Springer International Publishing AG, Chiang Mai, Thailand, pp.157-166.

5. Pramoun, T., Chotikawanida, P. and Amornraksa, T. (2018). "Enhanced Homomorphic Filter Based Image Watermarking Method", *Proc. the 8th International Congress on Engineering and Information (ICEAI2018),* May 1-4, Sapporo, Japan, pp. 193-204.
6. Pramoun, T., Supasirisun, P. and Amornraksa, T. (2018). "Digital Watermarking on Recolored Images for Protanopia", *Proc. of ECTI-CON 2018*, July 18-21, Chiang Rai, Thailand, pp. 258-261.
7. Chotikawanid, P., Pramoun, T., Thongkor, K., Supasirisun, P. and Amornraksa, T. (2018). "Image Watermarking Using Adaptive Local Noise Reduction Filter", *Proc. of ECTI-CON 2018,* July 18-21, Chiang Rai, Thailand, pp. 816-819.

Assoc.Prof. Dr. Peerapon Siripongwutikorn

รศ.ดร. พีรพล ศิริพงศ์วุฒิกร

1. Academic Background

2003 Ph.D. (Information Sciences), University of Pittsburgh, U.S.A.

1998 M.Sc. (Telecommunications), University of Pittsburgh, U.S.A.

1995 B.Eng. (Telecommunication Engineering), King Mongkut's Institute of Technology Ladkrabang, Thailand

2. Teaching Course

2.1 Current Teaching Courses

Undergraduate Courses

CPE 212 Algorithm Design	3 Credits
CPE 341 Computer Networks	3 Credits
CPE 442 Computer Network Laboratory	2 Credits

Graduate Courses

CPE 615 Experimental Design and Data Analysis	3 Credits
CPE 602 Computer Engineering Seminar	1 Credit

2.2 Teaching Courses in this Curriculum

CPE 615 Experimental Design and Data Analysis	3 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Pitakkotchakorn, N., Chibante Barroso, V. and Siripongwutikorn, P. (2021). "Log Data Traffic Characterization for Packet Loss Estimation in ALICE O2 System", *The 18th International Conference on Electrical Engineering/Electronics, Computer,*

Telecommunications and Information Technology (ECTI-CON 2021), 19-22 May 2021, Chiang Mai, Thailand. pp. 94–97, Article Number 9454816.

2. Chungsawat. N. and Siripongwutikorn. P. (2020). "Predicting Application Performance in LoRa IoT Networks", *The 11th International Coference on Advances in Information Technology (IAIT 2020).* 1-3 July 2020, Bangkok, Thailand, pp. 1-7.

3. Mindang, A. and Siripongwutikorn, P. (2020). "Solar Power Prediction in Iot Devices using Environmental and location Factors", *5th International Conference on Machine Learning Technologies (ICMIT 2020).* 19-21 June 2020, China, pp. 119-123.

4. Aungsutarn, A., Tharmmaphornphilas, W., Siripongwutikorn, P. (2020). "Effect of Cracking Furnace Parameters through Transfer Line Exchanger Outlet Temperature", *IEEE 7th International Conference on Industrial Engineering and Applications, ICIEA 2020*. 4-6 Jan 2020, Paris, France, pp. 682-686.

Assoc.Prof.Dr. Natasha Dejdumrong

รศ. ดร.ณัฐชา เดชดำรง

1. Academic Background

2000 D.Tech.Sci. (Computer Science and Information Management),
Asian Institute of Technology, Thailand

1994 M.S. (Computer Science), Asian Institute of Technology, Thailand.

1995 B.S. (Computer Science), Thammasat University, Thailand.

2. Teaching

2.1 Current Teaching Courses

Undergraduate Courses

CPE 121 Discrete Mathematics for Computer Engineers	3 Credits
CPE 212 Algorithm Design	3 Credits
CPE 361 Computer Graphics	3 Credits
CPE 467 Game Design and Development	3 Credits

Graduate Courses

CPE 630 Computer Aided Geometric Design	3 Credits
CPE 631 Advanced Geometric Modeling	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 630 Computer Aided Geometric Design	3 Credits
CPE 631 Advanced Geometric Modeling	3 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Nuntawisuttiwong, T. and Dejdumrong, N. (2019). "Fast and Efficient

Algorithms for Evaluating Uniform and Nonuniform Lagrange and Newton Curves". *World Academy of Science, Engineering and Technology, Open Science Index 152, International Journal of Computer and Information Engineering,* 13 (8), pp. 448 - 452.
In this database: https://publications.waset.org/

2. Nuntawisuttiwong, T. and Dejdumrong, N. (2019). "Monomial Form Approach to Rectangular Surface Modeling". *World Academy of Science, Engineering and Technology, Open Science Index 152, International Journal of Computer and Information Engineering,* 13 (8), pp. 453 – 457.
In this database: https://publications.waset.org

International Conference (weight value 0.4)

1. Damkham R, Dejdumrong, N and Pusawiro P. (2021). "Model Canvas and Process for Educational Game in Outcome-based Education", *International Conference on Technology, Pedagogy and Education (ICTPE 2021),* 4-5 February 2021, Bangkok, Thailand, pp. 1-4.
2. Nuntawisuttiwong, T. and Dejdumrong, N. (2018). "An Approach to Bézier Curve Approximation by Circular Arcs" *The 15th International Joint Conference on Computer Science and Software Engineering (JCSSE) July 11-13*, 2018, Faculty of ICT, Nakhon Pathom, Thailand, Article Number 8457180.

Asst. Prof. Dr. Nuttanart Facundes

ผศ. ดร.ณัฐนาถ ฟาคุนเด้ซ

1. Academic Background

2002 Ph.D. (Linguistics), State University of New York at Buffalo, U.S.A.

1999 M.A. (Linguistics), State University of New York at Buffalo, U.S.A.

1994 B.A. (Oriental Language), Chulalongkorn University, Thailand (2537 B.E.)

2. Teaching Course

2.1 Current Teaching Courses

Undergraduate Courses

CPE 101 Engineering Exploration	3 Credits
CPE 372 Natural Language Processing	3 Credits
CPE 374 Human-Computer Interaction	3 Credits

Graduate Courses

CPE 600 Technical Research Writing	3 Credits
CPE 641 Natural Language Processing	3 Credits
CPE 644 Speech Processing	3 Credits

2.2 Teaching Courses in this Curriculum

Graduate Courses

CPE 600 Technical Research Writing	3 Credits
CPE 641 Natural Language Processing	3 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Piyaphakdeesakun, C., Facundes, N.M. and Polvichai, J. (2019). “Thai Comments Sentiment Analysis on Social Networks with Deep Learning Approach”, *The 34th International Technical Confernce on Circuits/Systems, Computers and Communications 2019,* June 23-26, Jeju, Korea, pp. 361-384.
2. Facundes, N.M. (2019). “Peer Teaching for CDIO Standards in Computer Programming Education” *, E- learning Forum Asia 2019*, May 29-31, Bangkok, Thailand, pp. 67-68.
3. Facundes, N.M. (2019). “Peer Teaching as New Learning Experience in Computer Programming Education”, *FAUBAI 2019 Conference*, April 13-17, Brazil, pp. 1-5.
4. Facundes, N.M. (2018). “Computer-assisted Foreign Language Learning: Towards iCALL”, *13th Foreign Language Learning and research Conference*, 22-23 September, Matsuyama, Japan, pp. 1-5.

Assist.Prof.Dr. Jumpol Polvichai

ผศ. ดร.จุมพล พลวิชัย

1. Academic Background

2006 Ph.D. (Information Science), University of Pittsburgh, U.S.A.

2001 M.S. (Electrical and Computer Engineering), Carnegie Mellon University, U.S.A.

1997 M. Eng. (Computer Engineering), Chulalongkorn University, Thailand

1991 B.Eng. (Computer Engineering), King Mongkut's University of Technology Thonburi, Thailand.

2. Teaching Course

2.1 Current Teaching Courses

Undergraduate Courses

CPE 100 Computer Programming for Engineers	3 Credits
CPE 101 Engineering Exploration	3 Credits
CPE 371 Artificial Intelligence	3 Credits
CPE 376 Intelligent Robot Programming	3 Credits
CPE 377 Practical Robot Design	3 Credits

Graduate Courses

CPE 640 Artificial Intelligence	3 Credits
CPE 643 Applied Machine Learning	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 640 Artificial Intelligence	3 Credits
CPE 643 Applied Machine Learning	3 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Lamjiak, T., Kaewthongrach, R., Polvichai, J., Sirinaovakul, B. and Chidthaisong, A. (2019). "Leaf Characteristic Patterns Clustering Based on Self-Organizing Map" *Conference: IEEE Symposium Series on Computational Intelligence (SSCI 2019)*, December 6-9, Xiamen, China, pp. 901-908.
2. Piyaphakdeesakun, C., Facundes, N.M. and Polvichai, J. (2019). "Thai Comments Sentiment Analysis on Social Networks with Deep Learning Approach", *The 34th International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC2019),* 23-26 June, Jeju, Korea, pp. 381-384.
3. Visavakitcharoen, A., Ratanasanya, S. and Polvichai, J. (2019). "Improving Thai Herb Image Classification using Convolution Neural Networks with Boots up Features", *The 34th International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC2019),* June 23-26, Jeju, Korea, pp. 318-321.
4. Lamjiak, T., Keawthonggrach, R., Polvichai, J., pp. 318-321, Sirinaovakul, B., Ratanasanya, S. and Chidthaisong, A. (2019). "Clustering of Leaf Characteristics in Secondary Dry Dipterocarp Forest based on Particle Swarm Optimization", *The 4th International Conference on Digital Arts, Media and Technology and 2nd ECTI Northern Section Conference on Electrical, Electronics,Computer and telecommunication Engineering,* January30 -February 2, Nan, Thailand, pp. 251-254.
5. Ratanasanya, S., Nilanan, K., Yongjittigorngul, C., Harnsomburana, J., Sirinaovakul, B. and Polvichai, J. (2018). "Adaptive Non-Linear AI for Game Using Q-Learning", *International Conference on Mechanical, Electrical and Medical Intelligent System 2018 (ICMEMIS2018),* 4-6 November, Kiryu, Japan, pp. 1-6.
6. Polvichai, J. (2018). "An Effective Handwritten Digit Recognition with Convolutional Neural Network", *International Conference on Mechanical, Electrical and Medical Intelligent System) ICMEMIS 2018,* 2-8 November, Kiryu City, Japan, pp. 7-11.

Asst.Prof.Dr. Suthathip Maneewongvatana

ผศ. ดร.สุธาทิพย์ มณีวงศ์วัฒนา

1. Academic Background

2009 Ph.D. (Electrical and Computer Engineering), King Mongkut'S University of Technology Thonburi, Thailand.

2001 B.Eng. (Computer Engineering), King Mongkut'S University of Technology Thonburi, Thailand.

2. Teaching Course

2.1 Current Teaching Courses

Undergraduate Courses

CPE 223	Digital Electronics and Logic Design	3 Credits
CPE 315	Signals and Linear Systems	3 Credits

2.2 Teaching Courses in this Curriculum

Graduate Courses

CPE 790	Dissertation	36 credits
CPE 791	Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Phukhachee T., Maneewongvatana C. S., Angsuwatanakul T., Iramina K., Kaewkamnerdpong B., (2019). “Investigating the Effect of Intrinsic Motivation on Alpha Desynchronization Using Sample Entropy”, *Entropy 2019*, 21(3), Article Number 237.

   In this database: Web of Science

International Conference (weight value 0.4)

1. Phukhachee, T., Maneewongvatana, S., Kaewkamnerdpong, B. (2019). “Analyzing Motivational Components of Visual Cognitive Stimulus”, *BMEiCON 2019 - 12h*

Biomedical Engineering International Conference, 19-22 Nov, Ubon Ratchathani, Thailand, Article Number 8990317.

2. Maneewongvatana C.S., Suntornacane, A., Assawawayuyothin, N. (2018). "Book Recommended Formulation Based on Multiple Bibliographic Information", *11th International Conference on Education Technology and Computers*, 26-28 Oct 2018, Tokyo Japan, pp. 277-281.

Asst. Prof. Dr. Santitham Prom-on

ผศ. ดร.สันติธรรม พรหมอ่อน

1. Academic Background

2009 Ph.D. (Electrical and Computer Engineering), King Mongkut'S University of Technology Thonburi, Thailand.

2002 B.Eng. (Computer Engineering), King Mongkut'S University of Technology Thonburi, Thailand.

2. Teaching Courses

2.1 Current Teaching Courses

Undergraduate Courses

CPE 213 Data Models	3 Credits
CPE 325 Big Data	3 Credits
CPE 332 Professional Issues in Computer Engineering	3 Credits
CPE 373 Speech Processing	3 Credits

Graduate Courses

CPE 624 Big Data	3 Credits
CPE 642 Speech Processing	3 Credits

2.2 Teaching Courses in this Curriculum

Graduate Courses

CPE 621 Data Visualization	1 Credit
CPE 622 Data Science for Business	2 Credits
CPE 624 Big Data	3 Credits
CPE 642 Speech Processing	3 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Fairee, S., Khompatraporn, C., Sirinaovakul, B. and Prom-on, S. (2020). "Trim Loss Optimization in Paper Production Using Reinforcement Artificial Bee Colony", *IEEE Access 8*, pp. 130647-130660.
   In this database: Web of Science
2. Yi Xu, and Prom-on, S. (2019). "Economy of Effort or Maximum Rate of Information? Exploring Basic Principles of Articulatory Dynamics", *Frontiers in Psychology*, November, Vol. 10, Article Number 1753
   In this database: Web of Science
3. Fairee, S., Prom-on, S. and Sirinaovakul, B. (2018). "Reinforcement Learning for Solution Updating in Artificial Bee Colony*", PLoS ONE 13(7),* Article Number e0200738.
   In this database: Web of Science

International Conference (weight value 0.4)

1. Somsakul, S. and Prom-on, S. (2020). "On the Network and Topological Analyses of Legal Documents using Text Mining Approach", *The 1st International Conference on Big Data Analytics and Practices (IBDAP),* September 25-26, Bangkok, Thailand, pp. 1-6
2. Sirinaovakul, W., Eiamyingsakul, T., Tubtimtoe, N., Prom-on, S. and Taetragool, U. (2020). "The Relations Between Implementation Date of Policies and The Spreading of COVID-19", *The 1st International Conference on Big Data Analytics and Practices (IBDAP),* September 25-26, Bangkok, Thailand, pp. 1-6.
3. Thattinaphanich, S. and Prom-on, S. (2019). "Thai Named Entity Recognition Using Bi-LSTM-CRF with Word and Character Representation", *The 4th International Conference on Information Technology (InCIT),* October 24-25, pp. 149-154.

Asst.Prof.Dr. Phond Phunchongharn

ผศ. ดร.พร พันธุ์จงหาญ

1. Academic Background

2013 Ph.D. (Electrical and Computer Engineering), University of Manitoba, Canada

2007 M. Eng. (Computer Engineering) King Mongkut'S University of Technology Thonburi, Thailand.

2005 B.Eng. (Computer Engineering) King Mongkut'S University of Technology Thonburi, Thailand.

2. Teaching Courses

2.1 Current Teaching Courses

Undergraduate Courses

CPE 231 Database Systems	3 Credits
CPE 327 Software Engineering	3 Credits

Graduate Courses

CPE 611 Queuing Theory	3 Credits
CPE 621 Data Visualization	1 Credit

2.2 Teaching Courses in this Curriculum

CPE 611 Queuing Theory	3 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Kunakorntum, I., Hinthong, W. and Phunchongharn, P. (2020). “A Synthetic Minority Based on Probabilistic Distribution (SyMProD) Oversampling for

Imbalanced Datasets" *IEEE Access*, Published Online: 18 June 2020, Vol.8, pp. 114692-114704.
In this database: Web of Science

International Conference (weight value 0.4)

1. Pravalphruekul, N., Tangpornpisit, T., Limtoprasert, W., Phengphon, C., Hinthong, W., Herabutya, P. and Phunchongharn, P. (2020). "Detecting Philadelphia Chromosome on Metaphase Images using a Convolutional Neural Network", 1st International Conference on Big Data Analytics and Practices (IBDAP)", Thailand, Article Number 9245608.
2. Phanhong, M., Likitpanjamanon, P., Chareonwai, P., Srisurapanon, V. and Phunchongharn, P. (2020). "A Spot-recommendation System for Taxi Drivers Using Monte Carlo Optimization", *1st International Conference on Big Data Analytics and Practices (IBDAP),* Thailand, pp. 1-5. **Article Number 45611.**
3. Kiatkarun, K. and Phunchongharn, P. (2020). "Automatic Hyper-Parameter Tuning for Gradient Boosting Machine", *1st International Conference on Big Data Analytics and Practices (IBDAP),* Thailand, pp. 1-6, Article Number 9245609.
4. Sansaengtham, B., Barroso, VC., and Phunchongharn, P. (2020). "Survival Analysis For Computing Systems Using A Deep Ensemble Network", *IEEE International Conference on Control Science and Systems Engineering (ICCSSE),* China, pp. 57-62.
5. Li, Z., Kitcharoenpaisan, C., Phunchongharn, P., Yang, Y., Goh, R.S. M. and Li, Y. (2019). "Efficient Multi-Party Computational Algorithm Design for real-world Applications", *IEEE International Conference on Parallel and Distributed Systems (ICPADS),* December 4-6, Tianjin, China, pp. 1006-1009.
6. Arsomngern, P., Numcharoenpinij, N., Piriyataravet, J., Teerapan, W., Hinthong, W. and Phunchongharn, P. (2019). "Computer-Aided Diagnosis for Lung Lesion in Componion Animals from X-ray Images Using Deep Learning Techniques", *The 10th IEEE International Conference on Awareness Science and Technology (iCAST2019),* October 23-25, Aiina, Morioka, Japan, Article Number 8923126.

Asst.Prof.Dr. Khajonpong Akkarajitsakul

ผศ. ดร.ขจรพงษ์ อัครจิตสกุล

1. Academic Background

2012 Ph.D. (Electrical and Computer Engineering), University of Manitoba, Canada.

2007 M. Eng. (Computer Engineering) King Mongkut'S University Of Technology Thonburi, Thailand.

2005 B.Eng. (Computer Engineering) King Mongkut'S University Of Technology Thonburi, Thailand.

2. Teaching Course

2.1 Current Teaching Courses

Undergraduate Courses

CPE 231 Database Systems 3 Credits

CPE 327 Software Engineering 3 Credits

Graduate Courses

CPE 612 Game Theory 3 Credits

CPE 662 Special Topic: Resource Allocation in Communication Network and Optimization Technique 3 Credits

2.2 Teaching Courses in this Curriculum

CPE 612 Game Theory 3 Credits

CPE 662 Special Topic: Resource Allocation in Communication Network and Optimization Technique 3 Credits

CPE 790 Dissertation 36 credits

CPE 791 Dissertation 48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Udomkasemsub, O., Akkarajitsakul, K., and Achalakul, T. (2019). "Hybrid Moth-Flame and Salp-Swarm Optimization Algorithm", *International Journal of Modeling and Optimization*, Vol. 9, Issue. 4.
   In this database: Web of Science
2. Jenviriyakul, P., Chalumporn, G., Achalakul, T., Costa, F. and Akkarajitsakul, K. (2019). "ALICE Connex: A volunteer computing platform for the Time-Of-Flight calibration of the ALICE experiment. An opportunistic use of CPU cycles on Android devices", *Future Generation of Computer Systems,* Vol. 94, May, pp. 510-523.
   In this database: Web of Science

International Conference (weight value 0.4)

1. Tenpipat, W. and Akkarajitsakul, K. (2020). "Student Dropout Prediction: A KMUTT Case Study", *1st International Conference on Big Data Analytics and Practices (IBDAP),* Bangkok, Thailand, Article Number 9245457.
2. Kanagavelu, R., Li, Z., Samsudin, J., Yang, Y., Yang, F., Goh, R. S. M., Cheah, M., Wiwatphonthana, P., Akkarajitsakul, K. and Wang, S. (2020). "Two-phase multi-party computation enabled privacy-preserving federated learning", *20th IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing (CCGRID),* Melbourne, Australia**,** pp. 410-419, Article Number pp. 410–419, 9139658.
3. Mulyadi, F. and Akkarajitsakul, K. (2019). "Load Balancing in Distributed Systejms: A Non-Cooperative Game Approach", *Asian Conference on Engineering and Natural Sciences (2019 ACENS),* January 22-24, Hokkaido, Japan, pp. 240-254.
4. Mulyadi, F. and Akkarajitsakul, K. (2019). "A Dynamic Load Balancing Algorithm in Distributed Systems: A Non-Cooperative Game Approach", *Asian Conference on Engineering and Natural Sciences 2019*, Hokkaido, Japan, pp. 1-4.
5. Putjaika, N., Phunchongharn, P., Akkarajitsakul, K. and Taetragool, U. (2018). "Joint Mode Selection and Resource Allocation for Relay-Assisted Device-to-Device Networks", *28th International Telecommunication Networks and Applications Conference (ITNAC),* Sydney, Australia, pp. 435-440.

Asst. Prof. Dr. Priyakorn Pusawiro

ผศ. ดร.ปริยกร ปุสวิโร

1**. Academic Background**

2011 Dr.-Ing. (Doctorate in Computer Engineering) - University of Bremen, Germany

2004 M.S. (Information Communication System) - Technical University of Hamburg-Harburg, Germany

1996 M.Sc. (Computer Science) Chulalongkorn University, Thailand.

1991 B.S. (Statistics - Data Processing) Chulalongkorn University, Thailand.

2. Teaching Course

2.1 Current Teaching Courses

Undergraduate Courses

CPE 101 Engineering Exploration	3 Credits
CPE 375 Interactive Computing and Its Applications in Art and Sciences	3 Credits
CPE 300 Computer Professional Practices	2 Credits
CPE 401 Computer Engineering Project I	3 Credits
CPE 402 Computer Engineering Project II	3 Credits

Graduate Courses

CPE 663 Special Topic III Computing Design for Interactive Systems	3 Credits

2.2 Teaching Courses in this Curriculum

Graduate Courses

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Damkham, R., Dejdumrong, N., Pusawiro, P. (2021). 'Model Canvas and Process for Educational Game Design in Outcome-Based Education'. World Academy of Science,

Engineering and Technology, Open Science Index 170, International Journal of Educational and Pedagogical Sciences, 15(2), 251 - 256.
In this database: https://publications.waset.org/

International Conference (weight value 0.4)

1. Mokdara, T., Pusawiro, P. and Harnsomburana, J. (2018). "Personalized Food Recommendation Using Deep Neural Network", *7th ICT International Student Project Conference,* 11-13 July 2018, Nakhon Pathom, Thailand.

Petty Patent

1. นายไชยณรงค์ ทุนาภา และคณะ, ระบบควบคุมการทำงานของอุปกรณ์อิเล็กทรอนิกส์ผ่านผังภาพอธิบายพฤติกรรม, 29 พฤษภาคม 2562, เลขที่อนุสิทธิบัตร 15199.

Technical Report

1. Priyakorn, P. and Esic Lab Researcher Team - Department of Computer Engineering, KMUTT. "Design Framework and Develop Data Integration for Management Information System (MIS)" - Faculty of Engineering (Phase 1), July 2021.
2. ดร.ปริยกร ปุสวิโร และคณะ, "รายงานกรอบการออกแบบและพัฒนาระบบชิ้นงาน Interactive Application and AR Technology (Digital Technology for on-site museum)", เป็นส่วนหนึ่งของโครงการพัฒนาต้นแบบพิพิธภัณฑ์การเรียนรู้สู่ภูมิภาค สำหรับพิพิธภัณฑ์ท้องถิ่นขุนละหาร จังหวัดนราธิวาส; กันยายน 2562
3. Priyakorn, P. and esicLab Researcher Team - Department of Computer Engineering, KMUTT, "Analysis and Design of Video-On-Demand (VOD) Library System for Film Achive (Public Organization) Thailand; November 2018.

Interactive Art Installation

1. Priyakorn, P. and esicLab Researcher Team - Department of Computer Engineering, "CARP TALE", International Design Festival: Awakening Bangkok. Organized by Time Out Bangkok, the 2020 volume of Bangkok's biggest lighting installation fest returns with a timely theme of "RE/WIND/FAST/FORWARD", December 11-20, 2021.

Dr. Jaturon Harnsomburana

ดร.จาตุรนต์ หาญสมบูรณ์

1. Academic Background

2011	Ph.D. (Computer Science), University of Missouri – Columbia, U.S.A.
2001	M.S. (Computer Science), University of Missouri - Columbia, U.S.A.
1991	B.Eng. (Computer Engineering), Chulalongkorn University, Thailand.

2. Teaching Course

2.1 Current Teaching Courses

Undergraduate Courses

CPE 100 Computer Engineering for Engineering	3 Credits
CPE 111 Computer Exploration	3 Credits
CPE 326 Operation System	3 Credits
CPE 342 Java Programming Language	3 Credits
CPE 465 Multimedia Information Retrieval	3 Credits

2.2 Teaching Courses in this Curriculum

Graduate Courses

CPE 651 Multimedia Information Retrieval	3 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight 0.4)

1. Keskomon, N. and Harnsomburana, J. (2020). "Thai Character-Word LSTM Language Models with Dropout and Batch Normalization Education Tool", *2020 9th*

International Conference on Software and Computing Technologies (ICSCT 2020), 17-19 July 2020, China, pp. 1-4

2. Sripairojthikoon, N. and Harnsomburana, J. (2019). "Thai Sign Language Recognition Using 3D Convolutional Neural Networks", *The 7th International Conference on Computer and Communications Management (ICCCM 2019)*, July 27-29, Bangkok, Thailand, pp. 186-189.
3. Raksasataya, S., Polvichai, J., Harnsomburana, J., and Sirinoavakul, B. (2018). "Adaptive Non-Linear AI for Game Using Q-Learning", *Proc. of International Conference on Mechanical, Electrical and Medical Intelligent System*, Kiryu, Japan, pp. 1-6.
4. Mokdara, T., Pusawiro, P. and Harnsomburana, J. (2018). "Personalized Food Recommendation Using Deep Neural Network*", Proc. of ICT-ISPC 2018,* July 11-13, Nakhin Pathom, Thailand, Article Number 8523950.

Dr. Unchalisa Taetragool

ดร.อัญชลิสา แต้ตระกูล

1. Academic Background

2018 Ph.D. (Electrical and Computer Engineering), King Mongkut's Institute of Technology Thonburi, Thailand.

2018 Ph.D. (Engineering Mechanics), Virginia Tech (VT), Virginia, U.S.A.

2010 M. Eng. (Computer Engineering), King Mongkut's Institute of Technology Thonburi, Thailand.

2008 B.Eng. (Computer Engineering), King Mongkut's Institute of Technology Thonburi, Thailand.

2. Teaching Courses

2.1 Current Teaching Courses

Undergraduate Courses

CPE 102 Computer Programming Basics	3 Credits
CPE 329 Business Intelligence	3 Credits
CPE 393 Spicial Topics VII : Coding in AI	3 Credits
CPE 457 Special Topics III: Coding in AI	3 Credits
CPE 458 Modelling and Simulation for Computational Sciences	3 Credits

Graduate Courses

CPE 663 Sepcial Topic: Modelling and Simulation for Computational Sciences 3 Credits

2.2 Teaching Courses in this Curriculum

CPE 663 Special Topic III: Modelling and Simulation for Computational Sciences	3 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Yuan, L., Taetragool, U. and Batra, R.C. (2020). “Optimum First Failure Loads of One-and Two-Core Doubly Curved Sandwich Shells”. *AIAA Journal,* 58(8), pp. 3665-3679.
   In this database: Web of Science

International Conference (weight value 0.4)

1. Puengtambol, W., Prechaprapranwong, P. and Taetragool, U. (2021). “Implementation of quantum random walk on a real quantum computer”, *In Journal of Physics: Conference Series,* Vol. 1719, No. 1, pp. 012103. IOP Publishing.
2. Sirinaovakul, W., Eiamyingsakul, T., Tubtimtoe, N., Prom-on, S. and Taetragool, U.(2020). “September. The Relations Between Implementation Date of Policies and The Spreading of COVID-19”, *In 2020 1st International Conference on Big Data Analytics and Practices (IBDAP)*, pp. 1-6.
3. Pornsawangdee, K. and Taetragool, U. (2019). “Pattern Recognition of Effective Online Classified Advertisement”, *In 2019 IEEE 2nd International Conference on Knowledge Innovation and Invention,* ICKII, pp. 429-432.
4. Putjaika, N., Phunchongharn, P., Akkarajitsakul, K. and Taetragool, U. (2018). “November. Joint Mode Selection and Resource Allocation for Relay-Assisted Device-to-Device Networks”, *In 2018 28th International Telecommunication Networks and Applications Conference,* ITNAC, pp. 1-6.

Dr. Kharittha Jangsamsi

ดร.คริษฐา แจ้งสามสี

1 . Academic Background

2018 Ph.D. (Electrical and Computer Engineering), King Mongkut's Institute of Technology Thonburi, Thailand.

2012 M.Sc. (Computer Engineering), King Mongkut's Institute of Technology Thonburi, Thailand.

2009 B.Eng. (Electronics and Telecommunication Engineering), King Mongkut's Institute of Technology Thonburi, Thailand.

2. Teaching Courses

2.1 Current Teaching Courses

Undergraduate Courses

CPE 100 Computer Programming for Engineers	3 Credits
CPE 121 Discrete Mathematics for Computer Engineers	3 Credits
CPE 122 Basic Circuits and Electronics	3 Credits

Graduate Courses

CPE 663 Special topic III: Digital Image Processing and Analysis	3 Credits

2.2_Teaching Courses in this Curriculum

CPE 663 Special topic III: Digital Image Processing and Analysis	3 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1) Rakotondrajao, F. and Jangsamsi, K. (2019). “Road Boundary Detection for Straight Lane Lines Using Automation Inverse Perspective Mapping” *2019 International Symposium on Intelligent Signal Processing and Communication Systems (ISPACS 2019) December 3-6, 2019,* Taipei, Taiwan, Article Number 8986330.
2) Rakotondrajao, F. and Jangsamsi, K. (2019). “Road Boundary Detection for Straight and Curved Lane Lines” *2019 Asia Digital Processing Conference (ADIP 2019), December 21-23, 2019,* Kobe, Japan, pp. 59-63.
3) Rakotondrajao, F and Jangsamsi, K. (2019). "Road Boundary Detection for Straight Lane Lines Using Automatic Inverse Perspective Mapping", *Proc. of ISPACS 2019,* Beitou, December 3-6, Taipei, Taiwan, pp. 1-2.
4) Chotikawanida, P., Pramoun, T., Jangsamsi, K., Supasirisun, P., and Amornraksa, T. (2018). "Image Watermarking Using Adaptive Local Noise Reduction Filter", Proc. of ECTI-CON 2018, July 18 – 21, Chiang Rai, Thailand, pp. 154-157.

Dr. Prapong Prechaprapranwong

ดร. ประพงษ์ ปรีชาประพาพวงศ์

1. Academic Background

2011 Ph.D. (Electrical Engineering and Computer Science), Kanazawa University, Japan

2004 M. Eng. (Computer Engineering), King Mongkut's Institute of Technology Thonburi, Thailand.

1998 B.Eng. (Computer Engineering), King Mongkut's Institute of Technology Thonburi, Thailand.

2. Teaching Courses

2.1 Current Teaching Courses

Undergraduate Courses

CPE 100 Computer Programming for Engineers	3 Credits
CPE 111 Programming with Data Structures	3 Credits
CPE 212 Algorithm Design	3 Credits
CPE 223 Digital Electronics and Logic Design	3 Credits
CPE 401 Computer Engineering Project I	3 Credits
CPE 402 Computer Engineering Project II	3 Credits

2.2 Teaching Courses in this Curriculum

Graduate Courses

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Srakaew, S., Polvichai, J., Prechaprapranwong, P., Sukiyama, Y., Motohashi, K., Mochizuki, A., Ohara, K., Shirouzu, M. (2021). “Development and Verification Survey of Human Resource Development Program in engineer utilizing e-learning

System and Project Based Learning in Engineering with the cooperation of Japan and Thailand for the new normal after COVID-19" *2nd International Multidisciplinary Conference on Education, Innovation and Social Sciences 2021 (IMCEIS2021),* 25 September 2021, Kuala Lumpur, Malaysia (Virtual – YouTube Channel), pp. 1-6

2. Puengtambol, W., Preechaprapranwong, P. and Taetragool, U. (2020). "Implementation of Quantum Random Walk on A Real Quantum Computer" *15th Siam Physics Congress (SPC 2020),* 4-5 June 2020 (Online through Hubs), pp. 1-4.

Academic Reports

1. Management Systems International, ประพงษ์ ปรีชาประพาฬวงศ์, เยาวลักษณ์ จิตตะโคตร์, กฤตภาส วงค์มา, อาทร นกแก้ว, จุไรศิริ ชูรักษ์, พิมพ์ปวีณ์ สุวรรณโณ. (2563). รายงานวิจัยฉบับสมบูรณ์ โครงการประเมินผลการเรียนการสอนในรูปแบบสะเต็มศึกษาเพื่อพัฒนาทักษะอาชีพ ระยะต้น (Chevron Enjoy Science Project – Endline Evaluation Report), มูลนิธิคีนันแห่งเอเชีย, กรุงเทพฯ.
2. Management Systems International, ประพงษ์ ปรีชาประพาฬวงศ์, เยาวลักษณ์ จิตตะโคตร์, กฤตภาส วงค์มา, อาทร นกแก้ว, จุไรศิริ ชูรักษ์, พิมพ์ปวีณ์ สุวรรณโณ. (2562). รายงานวิจัยฉบับสมบูรณ์ โครงการประเมินผลการเรียนการสอนในรูปแบบสะเต็มศึกษาเพื่อพัฒนาทักษะอาชีพ ระยะกลาง (Chevron Enjoy Science Project – Midline Evaluation Report), มูลนิธิคีนันแห่งเอเชีย, กรุงเทพฯ.
3. Management Systems International, ประพงษ์ ปรีชาประพาฬวงศ์, เยาวลักษณ์ จิตตะโคตร์, กฤตภาส วงค์มา, อาทร นกแก้ว, จุไรศิริ ชูรักษ์, พิมพ์ปวีณ์ สุวรรณโณ. (2561). รายงานวิจัยฉบับสมบูรณ์ โครงการประเมินผลการเรียนการสอนในรูปแบบสะเต็มศึกษาเพื่อพัฒนาทักษะอาชีพ ระยะต้น (Chevron Enjoy Science Project – Baseline Evaluation Report), มูลนิธิคีนันแห่งเอเชีย, กรุงเทพฯ.

Assoc. Prof. Dr. Boonserm Kaewkamnerdpong

รศ.ดร.บุญเสริม แก้วกำเนิดพงษ์

1. Academic Background

2009 Ph.D. (Computer Science), University College London, U.K.

2002 M. Eng. (Mechatronics Engineering), Asian Institute of Technology, Thailand.

1999 B.Eng. (Computer Engineering), King Mongkut's Institute of Technology Thonburi, Thailand.

2. Teaching Courses

2.1 Current Teaching Courses

Undergraduate Courses

BIO 100	Biological Science in Modern Technology	3 Credits

Graduate Courses

BIE 510	Mathematical Modeling in Biological Engineering	3 Credits
BIE 601	Advanced Biological Engineering	3 Credits
BIE 602	Experimental Techniques in Biological Engineering	3 Credits
BIE 690	Seminar in Biological Engineering I	1 Credit
BIE 691	Seminar in Biological Engineering II	1 Credit
BIE 793	Seminar in Biological Engineering V	1 Credit
BIE 794	Seminar in Biological Engineering VI	1 Credit
BIE 795	Seminar in Biological Engineering VII	1 Credit
BIE 796	Seminar in Biological Engineering VIII	1 Credit
BIE 797	Seminar in Biological Engineering IX	1 Credit
BIE 798	Seminar in Biological Engineering X	1 Credit
BIE 790	Thesis	12 Credit
BIE 791	Thesis	36 Credits
BIE 792	Dissertation	36 credits

2.2 Teaching Courses in this Curriculum

Graduate Courses

CPE 790	Dissertation	36 credits
CPE 791	Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Angsuwatanakul, T., O'Reilly, J., Ounjai, K., Kaewkamnerdpong, B., & Iramina, K. (2020). "Multiscale Entropy as a New Feature for EEG and NIRS Analysis", *Entropy*, 22(2), Article Number 189.
   In this database: Web of Science
2. Phukhachee, T., Maneewongvatana, S., Angsuwatanakul, T., Iramina, K., and Kaewkamnerdpong, B. (2019). "Investigating the Effect of Intrinsic Motivation on Alpha Desynchronization Using Sample Entropy", *Entropy*, 21(3), Article Number 237.
   In this database: Web of Science
3. Attawibulkul, S., Sornsuwonrangsee, N., Jutharee, W., & Kaewkamnerdpong, B. (2019). "Using Storytelling Robot for Supporting Autistic Children in Theory of Mind", *International Journal of Bioscience, Biochemistry and Bioinformatics*, 9(2), pp. 100-108.
   In this database: Web of Science

International Conference (weight value 0.4)

1. Chaiyanan, C., and Kaewkamnerdpong, B. (2019). "A Study on Implicit Learning EEG using Sample Entropy to Further Development for ADHD Therapy", *The 12th Biomedical Engineering International Conference (BMEiCON),* Ubon Ratchathani, Thailand, pp. 1-5.
2. Phukhachee, T., Maneewongvatana, S., and Kaewkamnerdpong, B. (2019). "Analyzing Motivational Components of Visual Cognitive Stimulus", *The 12th*

Biomedical Engineering International Conference (BMEiCON), Ubon Ratchathani, Thailand, pp. 1-5.

3. Jutharee, W., Kaewkamnerdpong, B., Polvichai, J., and Maneewarn, T. (2019). "Using Bacteria Foraging Optimization in Gesture Reconfiguration from Joint Failure for Semi-Humanoid Robot", *The 19th International Conference on Control, Automation and Systems (ICCAS 2019),* Jeju, Korea, pp. 781-785.
4. Wanglavan, P., Jutharee, W., Maneewarn, T., and Kaewkamnerdpong, B. (2019). "The Development of Attention Detection Model from Child Behavior for Robot-Assisted Autism Therapy", *The 19th International Conference on Control, Automation and Systems (ICCAS 2019)*, Jeju, Korea, pp. 775-780.
5. Attawibulkul, S., Asawalertsak, N., Suwawong, P., Wattanapongsakul, P., Jutharee, W., and Kaewkamnerdpong, B. (2019). "Using a Daily Routine Game on the BLISS Robot for Supporting Personal-Social Development in Children with Autism and Other Special Needs", *The Society of Instrument and Control Engineers Annual Conference 2019*, Hiroshima, Japan, pp. 695-700.

Dr. Tassaneewan Laksanasopin

ดร.ทัศนีย์วรรณ ลักษณะโสภิณ

1. Academic Background

2015	Ph.D. (Biomedical Engineering), Columbia University, U.S.A.
2010	M.S. (Biomedical Engineering), Columbia University, U.S.A.
2007	B.Sc. (Physics), Prince of Songkla University, Thailand.

2. Teaching Courses

2.1 Current Teaching Courses

Undergraduate Courses

BIE 100 Biological Science in Modern Technology	3 Credits
GEN 111 Man and Ethics of Living	3 Credits
GEN 352 Technology and Innovation for Sustainable Development	3 Credits

Graduate Courses

BIE 600 Introduction to Biological Engineering	3 Credits
BIE 601 Advanced Biological Engineering	3 Credits
BIE 602 Experimental Techniques in Biological Engineering	3 Credits
BIE 690 Seminar in Biological Engineering I	1 Credit
BIE 691 Seminar in Biological Engineering II	1 Credit
BIE 692 Seminar in Biological Engineering III	1 Credit
BIE 693 Seminar in Biological Engineering IV	1 Credit
BIE 580 Biomedical Innovations: from lab to market	3 Credit
CHE 681 Pharmaceutical Design Problems I	3 Credit
CHE 682 Pharmaceutical Design Problems II	3 Credit

2.2 Teaching Courses in this Curriculum

Graduate Courses

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Akkapinyo, C., Laksanasopin, T., and Poo-arporn, R.P. (2021). "The Effect of Reduced Graphene Oxide and Methionine Film for Electrochemical Detection of Sunset Yellow", *Proc. Of KKU-IENC,* Khon Kaen, Thailand, pp. 1-4.
2. Laksanasopin, T., Suwansri, P., Juntaramaha, P., Keminganithi, K. and Achalakul, T. (2018). "Point-of-Care Device and Internet of Things Platform for Chronic Disease Management", *Proc. of IBIOMED,* Bali, Indonesia, pp. 80-83, Article Number 8534812.
3. Kaewkamnerdpong, B., Laksanasopin, T., Phaosawad, C., Attawibulkul, S. (2018). "Speech-Recognizing Robot for Assisting in Autism Therapy", Reports of research assisted by the Asahi Glass Foundation, pp. 1-12.

Dr. Sutatch Ratanaphan

ดร. สุทัศน์ รัตนพันธ์

1. Academic Background

2013	Ph.D. (Materials Science and Engineering), Carnegie Mellon University, U.S.A.
2010	M.Sc. (Materials Science and Engineering), University of California, Los Angeles (UCLA), U.S.A.
2005	B.S. (Physics), Mahidol University, Thailand

2. Teaching Courses

2.1 Current Teaching Courses

Undergraduate Courses

MEN 111 Engineering Materials	3 Credits
MEN 114 Engineering Materials Laboratory	1 Credit
MEN 116 Materials Testing Laboratory	1 Credit
MEN 312 Materials Engineering Research Tools	1 Credit

Graduate Courses

NST 603 Research Methodology for NanoSci and NanoTech	3 Credits

2.2 Teaching Courses in this Curriculum

Graduate Courses

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Sriondee, M., Chirayutthanasak, O., Nammahachak, N., Eknapakul, T., Nakajima, H., Meevasana, W. and Ratanaphan, S. (2021). "Ultraviolet-Induced Oxygen Vacancy in SrTiO3 Polycrystalline", *Applied Physics Letter*, 118(22), Article Number 221602.

In this database: Scopus

2. Yu, T., Chesser, I., Ratanaphan, S., Holm, E. A., Yang, S. and Deng, C. (2021). "Survey of Shear Coupling Behavior in FCC Ni and BCC Fe Grain Boundaries", *Materialia,* Vol. 15, Article Number 100945.
   In this database: Web of Science
3. Ratanaphan, S., Sarochawikasit, R., Kumanuvong, N., Hayakawa, S., Beladi, H., Rohrer, G. S. and Okita, T. (2019). "Atomistic simulations of grain boundary energies in austenitic steel", *Journal of Materials Science*, Vol. 54, pp. 5570-5583.
   In this database: Web of Science

International Conference (weight 0.4)

1. Chirayutthanasak, O., Sarochawikasit, R. and Ratanaphan, S. (2019). "Development of Grain Boundary Energy Function for Tungsten-Titanium Alloys", *The Second International Conference on Radiation and Emission in Materials (ICREM-2019),* 15 -18 Dec 2019, Bangkok, Thailand, pp. 1-7.
2. Chirayutthanasak, O., Wisitsorasak, A., Rujisamphan, N. and Ratanaphan, S. (2019). "Thermally Stable Nanocrystalline Tungsten-Titanium Alloy for a First Wall Fusion Reactor", *International Nuclear Science and Technology Conference (INST2019),* 4-6 Feb 2019, Bangkok, Thailand, pp. 1-4 (best presentation).

Assoc. Prof. Dr Orawan Duangphakdee

รศ.ดร อรวรรณ ดวงภักดี

1. Academic Background

2007 Ph.D. (Entomology) , Chulalongkorn University, Thailand

2002 B.Sc. (Biology), Chulalongkorn University, Thailand

2. Teaching Courses

2.1 Current Teaching Courses

Undergraduate Courses

RCC 102 Beeconnex	2 Credits
MIC101 General Biology	3 Credits
BIO100 Biological Science in Modern Technology	3 Credits
GEN231 Miracle of Thinking	3 Credits
GEN352 Technology and Innovation for Sustainable Development	3 Credits
GEN121 Learning and Problem-Solving Skills	3 Credits
GEN241 Beauty of Life	3 Credits

2.2 Teaching Courses in this Curriculum

Graduate Courses

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Zahoor, F., Sooklim, C., Songdech, P., Duangphakdee, O**.** and Soontorngun, N. (2021). "Selection of Potential Yeast Probiotics and a Cell Factory for Xylitol or Acid Production from Honeybee Samples", *Metabolites,* 11, 312.
   In this database: Web of Science

2. Laomettachit, T., Liangruksa, M., Termsaithong, T., Tangthanawatsakul, A and Duangphakdee, O. (2021). "A Model of Infection in Honeybee Colonies with Social immunity", *PLoS ONE* 16(2), Article Number e0247294.
   In this database: Scopus, Web of Science
3. Dror, S., Harich, F. Duanphakdee, O., Savini, T. Roberts, J., Ogutu, J. and Geheran, J. (2020). "Are Asian Elephants Afraid of Honeybees? Experimental Studies in Northern Thailand", *Mammalian Biology* 100. pp. 355-363.
   In this database: Web of Science
4. Rattanawannee, A., Duangphakdee, O., Warrit, N., Teerapakpinyo, C., Chanchao, C., Wongsiri, S. and Benjamin P. (2020). "Genetic Characterization of Exotic Commercial Honey Bee (Hymenoptera: Apidae) Populations in Thailand Reveals High Genetic Diversity and Low Population Substructure", *Journal of Economic Entomology*, 113(1). pp. 34-42. doi: 10.1093/jee/toz298.
   In this database: Web of Science

International Conference (weight value 0.4)

1. Boonmarueng, B., Prom-on, S., Preecha, R. and Duangphakdee, O. (2021). "Machine learning classifier to differentiate the hissing behavior from the other behavior of Apis cerana", *Thailand. KKU International Engineering Conference 2021 (KKU-IENC2021),* May 12-14, 2021 - Khon Kaen, Thailand.
2. Panyamang, A., Duangphakdee, O**.** and Rattanawannee, A. (2018). "Genetic structure of teak beehole borer", Xyleutes Ceramicus (Lepidoptera: Cossidae), in Northern Thailand**.** Agriculture and Natural Resources. 2018. 52(1): pp. 66-74**.**

Asst. Prof. Dr. Pinit Kumhom

ผศ.ดร. พินิจ คำหอม

1. Academic Background

2001 Ph.D. (Electrical and Computer Engineering), Drexel University, U.S.A.

1988 B.Eng. (Electrical Engineering), King Mongkut's Institute of Technology Thonburi, Thailand

2. Teaching

2.1 Current Teaching Courses

Graduate Courses

ENE 702 Thesis	12 Credits
EIE 701 Thesis	12 Credits
EIE 702 Research Study	6 Credits
EIE 504 Design and Analysis of Algorithms	3 Credits
EIE 505 Seminar	1 Credit
EIE 635 Integrated Circuit Design	3 Credits
EIE 636 System-on-Chip Design Methodology	3 Credits
EIE 694 Special Topic in EIE (Wireless Sensor Networks)	3 Credits

Undergraduate Courses

EIE 208 Electrical Engineering Mathematic	3 Credits
EIE 231 Digital Circuit and Logic Design	3 Credits
EIE 433 VLSI Technology	3 Credits
EIE 434 Design and Implementation of Digital Systems	3 Credits
ENE 208 Electrical Engineering Mathematic	3 Credits
ENE 231 Digital Circuit and Logic Design	3 Credits
ENE 433 VLSI Technology	3 Credits
ENE 434 Design and Implementation of Digital Systems	3 Credits

2.2 Teaching Courses in this Curriculum

ENE 795 Special Topic Design and Analysis of Algorithms	3 Credits
CPE 790 Dissertation	36 credits

CPE 791 Dissertation 48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Maruaisap, A., Khongprasongsiri, C., Suwansantisuk, W., and Kumhom, P. (2019). "A Parallel Pre-Processing for Multiple Objects Tracking System", *International Workshop on Advanced Image Technology,* 6-9 January 2019, Nanyang Technological University, Singapore, pp. 1-6.
2. Bandisak, P., Suwansantisuk, W., and Kumhom, P. (2019). "Classification of Speaking Activity Based on Lip Features in a Sequence of Video Frames", *International Workshop on Advanced Image Technology*, 6-9 January 2019, Nanyang Technological University, Singapore, pp. 1-5.
3. Nichaweerasit, N., Suwansantisuk, W., and Kumhom, P. (2019). "Classification of Student Activities Based on a Sequence of Images from a Single Camera", *International Workshop on Advanced Image Technology*, 6-9 January 2019, Nanyang Technological University, Singapore, pp. 1-5.
4. Khongprasongsiri, C., Suwansantisuk, W., and Kumhom, P. (2019). "An Investigation of Multiplication Error Tolerances in CNN and SIFT", *International Workshop on Advanced Image Technology*, 6-9 January 2019, Nanyang Technological University, Singapore, pp. 1-5.

Assoc. Prof. Dr. Raungrong Suleesathira

รศ. ดร.เรืองรอง สุลีสถิระ

1. Academic Background

2001 Ph.D. (Electrical Engineering), University of Pittsburgh, U.S.A.

1996 M.S. (Electrical Engineering), University of Pittsburgh, U.S.A.

1994 B.Eng. (Electrical Engineering), Kasetsart University, Thailand

2. Teaching Course

2.1 Current Teaching Courses

Graduate Courses

EIE 502 Probability Theory and Stochastic Processes	3 Credits
EIE 701 Thesis	12 Credits
EIE 702 Research Study	6 Credits

Undergraduate Courses

EIE 221 Principles of Communication Systems	3 Credits
EIE/ENE 422 Data Communications	3 Credits
EIE/ENE 460 Digital Signal Processing	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Kunarak, S. and Suleesathira, R. (2020). "Multi-criteria Vertical Handoff Decision Algorithm for Overlaid Heterogeneous Mobile IP Networks", *Journal of the Franklin Institute*, Vol. 357, No. 10, pp. 6321-6351.
   In this database: Web of Science

International Conference (weight value 0.4)

1. Suleesathira, R. (2021). “Robust Null Broadening Beamforming Based on Adaptive Diagonal Loading for Look Direction Mismatch”, *13th Conference on Knowledge and Smart Technology (KST 2021)*, January 2021, Chonburi, Thailand, pp. 49-54, Article Number 9415800.
2. Suleesathira, R. (2020). “Direction of Arrival Identification Using MUSIC Method and NLMS Beamforming”, *15th International Symposium on Artificial Intelligence and Natural Language Processing (iSAI-NLP 2020)*, November, Bangkok, Thailand, Article Number 9376838.
3. Suleesathira, R. (2020). “Robust LCSS Beamformer against DOA Mismatch”, *11th International Conference on Advances in Information Technology (IAIT 2020)*, July 2020, Bangkok, Thailand, Article Number 161561.
4. Suleesathira, R. (2020). “Projected Iterative MVDR Beamforming for Null Broadening and First Sidelobe Suppression in the Presence of DOA Mismatch,” *10th International Workshop on Compute Sciencer and Engineering (WCSE 2020),* Shamghai, China, pp. 606-613. Article Number 162177.

Assoc. Prof. Dr. Wudhichai Assawinchaichote

รศ. ดร.วุฒิชัย อัศวินชัยโชติ

1. Academic Background

2004 Ph.D. (Electrical Engineering), University of Auckland, New Zealand

1997 M.S. (Electrical Engineering), The Pennsylvania State University, U.S.A.

2009 M.B.A. (Business Administration), Chulalongkorn University, Thailand

1994 B.Eng. (Electrical Engineering), Second-Class Honors, Assumption University, Thailand

2. Teaching Course

2.1 Current Teaching Courses

- Graduate Courses

EEE 603 Advanced Mathematics for Electrical Engineering	3 Credits
EIE 500 Advanced Mathematics for Electrical and Information Engineering	3 Credits
EIE 501 System Theory	3 Credits
EIE 667 Digital Control Systems	3 Credits
EIE 669 Advanced Control Systems	3 Credits
EIE 701 Thesis	12 Credits
EIE 702 Research Study	6 Credits

- Undergraduate Courses

ENE 341 Linear Control Systems	3 Credits
EIE 341 Linear Control Systems	3 Credits
ENE 443 Advanced Control Systems	3 Credits
EIE 443 Advanced Control Systems	3 Credits

2.2 Teaching Courses in this Curriculum

ENE 795 Special Topic I: System Theory and Modeling	3 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

1.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Vorrawan, C., and Assawinchaichote, W. (2019). "H^{∞} Fuzzy Integral Controller for Nonlinear Descriptor Systems", *International Journal of Innovative Computing, Information and Control*, Vol. 15, No. 2, pp. 741-756.
   In this database: Scopus
2. Ruangsang, S., and Assawinchaichote, W. (2019). "Further Studies on Robust H^{∞} State Feedback Plus State-Derivative Feedback Controller for Uncertain Fuzzy Dynamic Systems", *International Journal of Innovative Computing, Information and Control*, Vol. 15, No. 3, pp. 1157-1176.
   In this database: Scopus
   Ruangsang, S., and Assawinchaichote, W. (2019). "Control of Nonlinear Markovian Jump System with Time Varying Delay via Robust H^{∞} Fuzzy State Feedback Plus State-Derivative Feedback Controller*", International Journal of Control Automation and System*, Vol. 17, No. 9, pp. 2417-2429.
   In this database: Scopus
3. Ruangsang, S., and Assawinchaichote, W. (2019). "A Novel Robust H^{∞} Fuzzy State Feedback Plus State-Derivative Feedback Controller Design for Nonlinear Time-Varying Delay Systems", *Neural Computing and Applications*, Vol. 31, No. 10, pp. 6303-6318.
   In this database: Web of Science, Scopus
4. Chayaopas, N., and Assawinchaichote, W. (2018). "A Novel Approach to Robust H^{∞} Integral Control for TS Fuzzy Systems", *Computational and Applied Mathematics*, Vol. 37, No. 2, pp. 954-977.
   In this database: Scopus

Assoc. Prof. Dr. Rardchawadee Silapunt

รศ. ดร.ราชวดี ศิลาพันธ์

1. Academic Background

2004 Ph.D. (Electrical and Computer Engineering), University of Wisconsin-Madison, U.S.A.

1998 M.S. (Electrical Engineering), University of Wisconsin-Madison, U.S.A.

1996 B.Eng. (Electrical Engineering), Chulalongkorn University, Thailand

2. Teaching Course

2.1 Current Teaching Courses

Graduate Courses

ENE 691/CPE 671 Special topics II (Sensors Technology)	3 Credits
ENE 692/EIE 692 Special topics III (Hard Disk Drive Technology)	3 Credits
EIE 701 Thesis	12 Credits
EIE 702 Research Study	6 Credits

Undergraduate Courses

ENE 325/EIE 325 Electromagnetic Fields and Waves	3 Credits
ENE 429/EIE 429 Antenna Theory	3 Credits
EIE 206 Computer Languages and Applications for Electrical Communication and Electronic Engineering	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Silapunt, R., Satitchantrakul, T., Torrungrueng, D., and Akkaraekthalin, P. (2019). “Compact Wideband Multi-section Quarter-Wave-Like Transformers”, *Journal of Electromagnetic Waves and Applications*, Vol. 2018, No. DOI 10.1080/092, pp. 1-14.
   In this database: Scopus
2. Silapunt, R., and Watcharakitchakorn, O. (2018). “Design and Modeling of the Photonic Crystal Waveguide Structure for Heat-Assisted Magnetic Recording”, *Advances in Materials Science and Engineering*, Vol. 2, No.2, pp. 11-22.
   In this database: Scopus, Web of Science
3. Satitchantrakul, T., Silapunt, R., Torrungrueng, D., Akkaraekthalin, P., and Chudpooti, N. (2018). “An Implementation of Compact Quarter-Wave-Like-Transformers Using Multi-Section Transmission Lines”, *Radio Engineering*, Vol. 27, No. 1, pp. 101-109.
   In this database: Scopus
4. Choowitsakunlert, S., Silapunt, R., Yokoi, H., Takagiwa, K., Kobashigawa, T., and Hosoya, N. (2018). “Photosensitive Adhesive Bonding Process of Magnetooptic Waveguideswith Si Guiding Layer for Optical Nonreciprocal Devices”, *Japanese Journal of Applied Physics*, Vol. 57, No. 5, pp. 058007 1-2.
   In this database: Scopus
5. Silapunt, R., Choowitsakunlert, S., Yokoi, H., Kobashigawa, T., Hosoya, N. (2018). “Temperature-Insensitive Design of Waveguide Isolator Employing Nonreciprocal Guided-radiation Mode Conversion”, *Japanese Journal of Applied Physics*, Vol. 57, No. 11, pp. 112201-112216.
   In this database: Scopus

Assoc. Prof. Dr. Wuttipong Kumwilaisak

รศ. ดร.วุฒิพงษ์ คำวิลัยศักดิ์

1. Academic Background

2004 Ph.D. (Electrical Engineering), University of Southern California, U.S.A.

1999 M.S. (Electrical Engineering), University of Southern California, U.S.A.

1995 B.Eng. (Electrical Engineering), Chulalongkorn University, Thailand

2. Teaching Course

2.1 Current Teaching Courses

Graduate Courses

EIE 701 Thesis	12 Credits
EIE 702 Research Study	6 Credits

Undergraduate Courses

ENE 301 Introduction to Probability Random Processes for Engineers	3 Credits
ENE 424 Mobile Communication Systems	3 Credits
EIE 424 Mobile Communication Systems	3 Credits
ENE 492 Special Topics in Electrical Engineering: Introduction to Multimedia Processing	3 Credits
ENE 105 Computer Programming for Electrical Communication and Electronic Engineering	3 Credits
ENE 206 Computer Languages and Applications for Electrical Communication and Electronic Engineering	3 Credits
EIE 206 Computer Languages and Applications for Electrical Communication and Electronic Engineering	3 Credits
GEN 241 Beauty of Life	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Kumwilaisak, W., Piriyatharawet, T., Lasang, P. and Thatphithakkul, N. (2020). "Image Denoising with Deep Convolutional Neural and Multi-Directional Long Short-Term Memory Networks Under Poisson Noise Environments", *IEEE Access*, pp. 86998-87010. In this database: Scopus, Web of Science
2. Tarnoi, S., Kumwilaisak, W., Suppakitpaisarn, V., Fukuda, K., and Yusheng, J. (2019). "Adaptive Probabilistic Caching Technique for Caching Networks with Dynamic Content Popularity", *Computer Communications*, Vol. 139, No. 2, pp. 1-15.
   In this database: Scopus, Web of Science

International Conference (weight value 0.4)

1. Piriyataravet, J., Kumwilaisak, W. and Chinrungrueng, J. (2021). "Automatic Bus Stop Detection with Deep Neural Networks and Bi-directional LSTM", *2021 Second International Symposium on Instrumentation, Control, Artificial Intelligence, and Robotics (ICA-SYMP)*, pp. 1-4.
2. Kumwilaisak, W., Piriyatharawet, T., Lasang, P. and Thatphithakkul, N. (2020). "On the Numerical Distortion-Mutual Information Function of Image Denoising with Deep Convolutional Networks", *2020 17th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON)*, pp. 474-477.

Asst. Prof. Dr. Chirasil Chayawan

ผศ. ดร.จิรศิลป์ จยาวรรณ

1. Academic Background

2002	Ph.D. (Electrical Engineering), Florida Atlantic University, U.S.A.
1997	M.S. (Electrical and Computer Engineering), Florida Atlantic University, U.S.A.
1991	B.Eng. (Electronics Engineering), King Mongkut's Institute of Technology Ladkrabang, Thailand

2. Teaching

2.1 Current Teaching Courses

Graduate Courses

EIE 635 Detection Theory	3 Credits
EIE 694 Special Topic IV (Green ICT Management)	3 Credits
EIE 695 Special Topic IV (Modern Telecommunication Management)	3 Credits
EIE 697 Special Topic IV (Telecommunication Innovation in Business)	3 Credits
EIE 701 Thesis	12 Credits
EIE 702 Research Study	6 Credits

Undergraduate Courses

ENE 483 Fundamentals of Green ICT Management	3 Credits
ENE 490 Special Topic (Telecommunication Engineering Practice)	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. K-Marchai, C., and Chayawan, C. (2020). “Adaptive Hybrid AOA/TDOA Method with Desensitization Testing to Evaluate Geolocation of Harmful Interference in Urban Areas”, *International Journal of Electronics and Data Communication*, Vol. 8, No. 3, pp. 7–16.
   In this database: Scopus
2. Malisuwan, S., Chayawan, C., and Kaewphanuekrungsi, W. (2020). “Establishment of Regulatory Sandbox: A Case Study of Thailand’s Regulatory Sandbox”, *International Journal of the Computer, the Internet and Management*, Vol. 28, No.1, pp. 84–91.
   In this database: Scopus

International Conference (weight value 0.4)

1. Chayawan C., and K-marchai, C. (2019). “Adaptive Hybrid AOA/TDOA Method with Desensitization Testing to Evaluate Geolocation of Harmful Interference in Urban Areas”, *The IRES - 747th International Conference on Innovative Engineering Technologies (ICIET)*, 21-22 December 2019, Baiyoke Boutique Hotel, Bangkok, Thailand, pp. 19-28.

Asst. Prof. Dr. Kamon Jirasereeamornkul

ผศ. ดร.กมล จิรเสรีอมรกุล

1. Academic Background

2006	Ph.D. (Electrical and Computer Engineering), King Mongkut's University of Technology Thonburi, Thailand
2001	M.Eng. (Electrical Engineering), King Mongkut's University of Technology Thonburi, Thailand
1997	B.Eng. (Electronic and Telecommunication Engineering), King Mongkut's Institute of Technology Thonburi, Thailand

2. Teaching Course

2.1 Current Teaching Courses

Graduate Courses

1. EEE 602 Advances in Electrical Engineering	3 Credits
2. ENE 514 Analysis and Design of Electronic Systems	3 Credits
3. ENE 693 Special Topics EE V (Resonant Power Converter)	3 Credits
4. EIE 701 Thesis	12 Credits
5. EIE 702 Research Study	6 Credits

Undergraduate Courses

1. ENE 100 Electrotechnology (Electronics)	3 Credits
2. ENE 206 Computer Languages and Applications for Electrical Communication and Electronic Engineering	3 Credits
3. ENE 201 Electrical Systems and Safety	3 Credits
4. ENE 210 Electronic Devices and Circuit Design I	3 Credits
5. ENE 414 Audio Engineering	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	36 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Kaewthai, S., Ekkaravarodome, C. and Jirasereeamornkul, K. (2021). "Novel Disturbance and Observation based Active Islanding Detection for Three-Phase Grid-Connected Inverters", *Journal of Power Electronics*, Vol.21, No.2, pp. 438-450.
   In this database: Scopus, Web of Science
2. Puengsungwan, S. and Jirasereeamornkul, K. (2020). "LoT Based Root Stress Detection for Lettuce Culture Using Infrared Leaf Temperature Sensor and Light Intensity Sensor", *Wireless Personal Communications*, Vol.115 No.3, pp. 3215-3233
   In this database: Scopus, Web of Science
3. Ekkaravarodome, C., Jirasereeamornkul, K. and Thounthong, P. (2018). "Implementation of Zero-Ripple Line Current Induction Cooker using Class-D Current-Source Resonant Inverter with Parallel-Load Network Parameters under Large-Signal Excitation", *Journal of Electrical Engineering & Technology*, Vol. 13(3), pp. 1251-1264.
   In this database: Scopus
4. Mangkalajan, S., Ekkaravarodome, C., Thounthong, P., Jirasereeamornkul, K., Higuchi, K. and Kazimierczuk, M. K. (2018). "A Single-Stage LED Driver Based on ZCDS Class-E Current-Driven Rectifier as a PFC for Street-Lighting Applications", *IEEE Transactions on Power Electronics,* Vol. 33, No. 10, pp. 8710-8727.
   In this database: Scopus, Web of Science

Asst. Prof. Dr. Apichai Bhatranand

ผศ. ดร.อภิชัย ภัทรนันท์

1. Academic Background

2004 Ph.D. (Electrical Engineering), Texas A&M University, U.S.A.

1998 M.Eng. (Electrical Engineering), Texas A&M University, U.S.A.

1995 B.Eng. (Electrical Engineering), Mahidol University, U.S.A.

2. Teaching Course

2.1 Current Teaching Courses

Graduate Courses

ENE 623 Optical Networks	3 Credits
EIE 650 Optical Communication	3 Credits
EIE 691 Special Topics (Optical Engineering)	3 Credits
EIE 696 Special Topics (Optical Network)	3 Credits

Undergraduate Courses

ENE 206 Computer Languages and Applications for Electrical Communication and Electronic Engineering	3 Credits
ENE 311 Physics of Electronic Materials and Devices	3 Credits
ENE 312 Electronic Engineering Laboratory	1 Credit
ENE 423 Optical Communications	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	36 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Prajakkan, D., Bhatranand, A., and Jiraraksopakun, Y. (2019). "Design and Simulation of Thin Film Anti-Reflection Coating on Si-Based Photonic Devices", *The 16th International Conference on Electrical Engineering/Electronics Computer, Telecommunication and Information Technology (ECTI 2019)*, 10-13 July 2019, D Varee Jomtien Beach Hotel, Chonburi, Thailand, pp. 1008-1011.
2. Khun-in, R., Takagi, M., Usuda, Y., Bhatranand, A., and Yokoi, H. (2019). "Simulation Perturbation of 3D Printed Long-Period Fiber Grating Devices for Controllable Resonant Wavelengths", *Optical Sensors and Sensing Congress 2019*, 25-27 June 2019, San Jose McEnery Convention Center, San Jose, U.S.A., pp. 1-2.
3. Khun-in, R., Usuda, Y., Bhatranand, A., and Yokoi, H. (2019). "The Study of Coupled-Mode Characteristics from Resonant Wavelengths Inside Fiber Grating Structure", *The 19th International Conference on Numerical Simulation of Optoelectronic Devices*, 8 - 12 July 2019, University of Ottawa, Ottawa, Canada, pp. 23-24.
4. Kittipoom, I., Bhatranand, A., Jiraraksopakun, Y., and Auapong, A. (2019). "Comparison of IEEE 802.11n and IEEE 802.11ac Wireless Technology Performances on 2.4 GHz and 5 GHz", *Proceedings of the 9th RMUTP International Conference on Science (ICONSci9)*, 21-22 June 2019, The Sukosol, Thailand, pp. 133-142.

Asst. Prof. Dr. Yuttapong Jiraraksopakun

ผศ. ดร.ยุทธพงษ์ จิรรักษ์โสภากุล

1. Academic Background

2009 Ph.D. (Electrical and Computer Engineering), Texas A&M University, U.S.A.

2004 M.Eng. (Electrical and Computer Engineering), Texas A&M University, U.S.A.

2000 B.Eng. (Electrical Engineering), Chulalongkorn University, Thailand

2. Teaching Course

2.1 Current Teaching Courses

Graduate Courses

ENE 563 Biomedical Image Processing	3 Credits
ENE 564 Principles of Magnetic Resonance Imaging	3 Credits
EIE 648 Biomedical Image Processing	3 Credits
EIE 675 Principles of Magnetic Resonance Imaging	3 Credits

Undergraduate Courses

EIE 105 Computer Programing for Electrical Communication and Electronic Engineering	3 Credits
ENE 103 Electrotechnology I (Electronics)	3 Credits
ENE 465 Introduction to Medical Imaging	3 Credits
ENE 466 Principles of Magnetic Resonance Imaging	3 Credits
EIE 465 Introduction to Medical Imaging	3 Credits
EIE 466 Principles of Magnetic Resonance Imaging	3 Credits
CMM 211 Electronics and Digital Circuit Concepts	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Prajakkan, D., Bhatranand, A., and Jiraraksopakun, Y. (2019). “Design and Simulation of Thin Film Anti-Reflection Coating on Si-Based Photonic Devices”, *The 16th International Conference on Electrical Engineering/Electronics, Computer, Telecommunication and Information Technology (ECTI 2019)*, 10-13 July 2019, D Varee Jomtien Beach Hotel, Chonburi, Thailand, pp. 1008-1011.
2. Kittipoom, I., Bhatranand, A., Jiraraksopakun, Y., and Auapong, A. (2019). “Comparison of IEEE 802.11n and IEEE 802.11ac Wireless Technology Performances on 2.4 GHz and 5 GHz”, *Proceedings of the 9th RMUTP International Conference on Science (ICONSci9),* 21-22 June 2019, The Sukosol, Thailand, pp. 133-142.
3. Nanjo, K., Bhatranand, A., Jiraraksopakun, Y., Yokoi, H., Khun-in, R., and Takagi, M. (2018). “Fabrication of Mechanically Induced Long-Period Fiber Grating By Using 3D Printer”, *The 12th SEATUC Symposium,* 12-13 March 2018, The Graduate School of Universitas Gadjah Mada, Yogyakarta, Indonesia, pp. OS03-07.
4. Takagi, M., Khun-in, R., Jiraraksopakun, Y., Bhatranand, A., and Yokoi, H. (2018). “Evaluation of Resonant Wavelength from Mechanically Induced Long-Period Fiber Grating Fabricated by 3D Printer”, *Microoptics Conference (MOC2018)*, 15-18 October 2018, International Convention Center, Taipei, Taiwan, pp. 1-2.
5. Khun-in, R., Takagi, M.o., Nanjo, K., Jiraraksopakun, Y., Bhatranand, A., and Yokoi, H. (2018). “Resonant Wavelength Observation by 3D Printed Mechanically Induced Long-Period Fiber Grating Device”, *Proceedings of the Advanced Photonics Congress (APC2018)*, 2-5 July 2018, ETH Zurich, Zurich, Switzerland, pp. 1-2.

Asst. Prof. Dr. Watcharapan Suwansantisuk

ผศ. ดร.วัชรพันธ์ สุวรรณสันติสุข

1. Academic Background

2012 Ph.D. (Electrical Engineering), Massachusetts Institute of Technology, U.S.A.

2004 M.S. (Electrical Engineering), Massachusetts Institute of Technology, U.S.A.

2002 B.S. (Electrical and Computer Engineering), Carnegie Mellon University, U.S.A.

2. Teaching Course

2.1 Current Teaching Courses

Graduate Courses

EIE 640 Information Theory and Coding Techniques	3 Credits

Undergraduate Courses

EIE 301 Introduction to Probability and Random Processes for Engineers	3 Credits
EIE 467 Digital Communications	3 Credits
EIE 450 Applied Communications and Transmission Lines	3 Credits
EIE 324 Communication and Telecommunication Laboratory	1 Credit
ENE 324 Communication and Telecommunication Laboratory	1 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Bandisak, P., Suwansantisuk, W., and Kumhom, P. (2019). "Classification of Speaking Activity Based on Lip Features in a Sequence of Video Frames", *International Workshop on Advanced Image Technology*, 22 March 2019, Singapore, pp. 1-5.

2. Nichaweerasit, N., Suwansantisuk, W., and Kumhom, P. (2019). “Classification of Student Activities Based on a Sequence of Images from a Single Camera”, *International Workshop on Advanced Image Technology*, 22 March 2019, Singapore, pp. 1-5.
3. Lekprasert, B., Suwansantisuk, W., and Tantiwisawaruji, S. (2018). “Analysis of Understanding in the Speed of an Electromagnetic Wave and in the Principle of Refraction: A Case Study of KMUTT (Ratchaburi) Engineering Freshmen”, *Siam Physics Congress*, 21 May 2018, Phitsanulok, Thailand, pp. 1-5.
4. Yongwiriyakul, A., and Suwansantisuk, W. (2018). “Bit Error Rates of GFDM under Time-Varying Channels and Synchronization Errors”, *IEEE International Colloquium on Signal Processing & Its Applications,* 9-10 March 2018, Batu Feringghi, Malaysia, pp. 176-181.
5. Suksawang, R., and Suwansantisuk, W. (2018). “Performance of RSS-based Localization in Unknown Environments”, *IEEE International Colloquium on Signal Processing & Its Applications*, 9-10 March 2018, Batu Feringghi, Malaysia, pp. 25-30.

Asst. Prof. Dr. Suwat Pattaramalai

ผศ. ดร.สุวัฒน์ ภัทรมาลัย

1. Academic Background

2007 Ph.D. (Electrical Engineering), Florida Atlantic University, U.S.A.

1996 M.Eng. (Electrical Engineering), Florida Atlantic University, U.S.A.

1991 M.Eng. (Electronic Engineering), Chulalongkorn University, Thailand

2. Teaching Course

2.1 Current Teaching Courses

Graduate Courses

ENE 561	Digital Communications	3 Credits
EIE 674	Special topics III (Wireless Sensor Network)	3 Credits

Undergraduate Courses

EIE 490	Special topics I (Introduction to mobile broadband)	3 Credits
ENE 212	Electronic Circuits and Devices	3 Credits
ENE 221	Principles of Communication Systems	3 Credits
ENE 312	Electronic Engineering Laboratory	1 Credit
ENE 467	Digital Communications	3 Credits
ENE 490	Special topics I (Introduction to mobile broadband)	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790	Dissertation	36 credits
CPE 791	Dissertation	48 credits

3 .Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Songratthaset, D., and Pattaramalai, S. (2019). “An Orthogonal Polynomial-Based Analytical Expression of Nonlinear Power Amplifier for FBMC Systems”, *IEEE Access,* Vol. 7, No. 2, pp. 107072-107082.
   In this database: Scopus, Web of Science

International Conference (weight value 0.4)

1. Chuenwittayaporn, J., and Pattaramalai, S. (2019). “Design and Analysis of Network on ISP Using Multi-Homing BGP with Load Sharing”, *EECon-42*, 30 Oct– 1 Nov, Nakhonratchasima, Thailand, pp. 15-31.
2. Meesa-ard, E., and Pattaramalai, S. (2018). “Outage Probability of Mobility Incorporated alpha-mu Fading Distribution with Co-channel Interference in Heterogeneous Networks*”, 2018 IEEE International Conference on Smart Internet of Things (SmartIoT),* 17-19 Aug, Xi'an, China, pp. 102-115.
3. Visarntakul, T., and Pattaramalai, S. (2018). “Energy Consumption Analysis of Digital Wireless Communication in Nakagami Fading for IoT Applications”, *The 21st International Symposium on Wireless Personal Multimedia Communications (WPMC-2018)*, 25-28 November, Chiang Rai, Thailand, pp. 200-215.
4. Warasup, K., Hamamura, M., and Pattaramalai, S. (2018). “Asynchronous Requests for Multiple Packet Transmissions in Wireless Networks”, *The 21st International Symposium on Wireless Personal Multimedia Communications (WPMC-2018),* 25-28 November, Chiang Rai, Thailand, pp. 65-79.

Asst. Prof. Dr. Anawach Sangswang

ผศ. ดร.อนวัช แสงสว่าง

1. Academic Background

2003 Ph.D. (Electrical Engineering), Drexel University, U.S.A.

1999 M.Sc. (Electrical Engineering), Drexel University, U.S.A.

1995 B.Eng. (Electrical Engineering), KMUTT, Thailand

2. Teaching Courses

2.1 Current Teaching Courses

Graduate Courses

EEE 600 System Analysis Techniques	3 credits
EEE 674 Modeling Analysis and Simulation	3 credits
EEE 606 Thesis (Electrical Engineering)	12 credits

Undergraduate Courses

EEE 110 Electric Circuit	3 credits
EEE 105 Electric Circuits	3 credits
EEE 111 Electric Circuit Analysis	3 credits
EEE 397 Seminar & Electrical Engineering Mini Project	1 credit
EEE 433 Computer Methods in Power System Analysis	3 credits
EEE 498 Electrical Engineering Project Study	1 credit
EEE 499 Electrical Engineering Project	3 credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Sangswang, A., and Konghirun, M. (2020). “Optimal Strategies in Home Energy Management System Integrating Solar Power, Energy Storage, and Vehicle-to-Grid for Grid Support and Energy Efficiency”, *IEEE Transactions on Industry Applications*, Vol. 56, No. 5, September/October, pp. 5716-5728.
   In this database: Scopus, Web of Science
2. Gurung, S., Jurado, F., Naetiladdanon, S., and Sangswang, A. (2019). “Comparative Analysis of Probabilistic and Deterministic Optimization Methods to Tune the Power System Stabilizers for Enhancement of System Small-Signal Stability”, *Electric Power Systems Research*, Vol. 181, No. 1, pp. 1-10.
   In this database: Scopus, Web of Science
3. Limsakul, C., Sangswang, A., and Songprakorp, R. (2019). “An Application of Energy Storage to Mitigate Power System Frequency Deviation due to PV Power Fluctuation”, *International Review of Electrical Engineering*, Vol. 14, No. 6, pp. 453-464.
   In this database: Scopus
4. Boonyapakdee, N., Konghirun, M., and Sangswang. A. (2019). “Separated Phase–Current Controls Using Inverter-Based DGs to Mitigate Effects of Fault Current Contribution from Synchronous DGs on Recloser–Fuse”, *Applied Sciences*, Vol. 9, No. 20, pp. 1-22.
   In this database: Scopus
5. Gurung, S., Jurado, F., Naetiladdanon, S., and Sangswang, A. (2019). “Optimized tuning of power oscillation damping controllers using probabilistic approach to enhance small-signal stability considering stochastic time delay", *Electrical Engineering*, Vol. 101, No. 2, pp. 3-16.
   In this database: Scopus
6. Kranprakon, P., Sangswang, A., and Naetiladdanon, S. (2019). “ZVS-Operation of LLC Resonant Inverter with Phase Limit Control for Induction furnace”, *ECTI Transactions on Computer and Information Technology*, Vol. 13, No. 1, pp. 29-36.
   In this database: Scopus, Web of Science

Assoc. Prof. Dr. Mongkol Konghirun

รศ. ดร.มงคล กงศ์หิรัญ

1. Academic Background

2003 Ph.D. (Electrical Engineering), The Ohio State University, U.S.A.

1999 M.S. (Electrical Engineering), The Ohio State University, U.S.A.

1995 B.Eng. Electrical Engineering), KMUTT, Thailand (B.E. 2538)

2. Teaching Courses

2.1 Current Teaching Courses

EEE 600 System Analysis Techniques	3 Credits
EEE 606 Thesis (Electrical Engineering)	12 Credits
EEE 397 Seminar & Electrical Engineering Mini Project	1 Credit
EEE 424 Electric Drives	3 Credits
EEE 498 Electrical Engineering Project Study	1 Credit
EEE 499 Electrical Engineering Project	3 Credits

2.2 **Teaching Courses in this Curriculum**

EEE 795 Special Topic Railway Technologies for Electrical Engineer	3 Credits
CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Sangswang, A., and Konghirun, M. (2020). "Optimal Strategies in Home Energy Management System Integrating Solar Power, Energy Storage, and Vehicle-to-Grid for Grid Support and Energy Efficiency", *IEEE Transactions on Industry Applications*. Vol. 56, No. 5, Sept-Oct, pp. 5716-5728.

   In this database: Scopus, Web of Science

2. Boonyapakdee, M., Konghirun, M., and Sangswang, A. (2019). “Separated Phase–Current Controls Using Inverter-Based DGs to Mitigate Effects of Fault Current Contribution from Synchronous DGs on Recloser–Fuse”, *Applied Sciences Journal*. Vol. 9, Issue. 20, pp. 1-21. In this database: Scopus

International Conference (weight value 0.4)

1. Hatchavanich, N., Sangswang, A., and Konghirun, M. (2019). “Operation Region of Novel Multi-Coil Series-Series Compensation in Wireless Power Transfer System for Electric Vehicle Applications”, *IEEE International Symposium on Circuits and Systems (ISCAS 2019)*. 26-29 May, Sapporo, Japan, pp. 1-3.
2. Hatchavanich, N., Sangswang, A., and Konghirun, M. (2019). “Effects of Intermediate Coil Position in a Triple- Coil Series-Series Compensation in Wireless Power Transfer”, *IEEE International Symposium on Circuits and Systems (ISCAS 2019)*. 26-29 May 2019, Sapporo, Japan, pp. 1-3.

Dr. Piyasawat Navaratana Na Ayudhya

ดร.ปิยสวัสดิ์ นวรัตน์ ณ อยุธยา

1. Academic Background

2011 Ph.D. (Electrical and Computer Engineering),
King Mongkut's University of Technology Thonburi, Thailand

2000 M.Eng (Electrical Engineering), KMUTT, Thailand

1997 B.Eng (Electronics and Telecommunication Engineering)
King Mongkut's University of Technology Thonburi, Thailand

2. Teaching Courses

2.1 Current Teaching Courses

- Graduate courses

EEE 606	Thesis (Electrical Engineering)	12 Credits

- Undergraduate courses

EEE 272	Introduction to Digital and Microprocessor	3 Credits
EEE 381	Microprocessors	3 Credits
EEE 393	Electrical Engineering Laboratory I	1 Credit
EEE 397	Seminar & Electrical Engineering Mini Project	1 Credit
EEE 474	Industrial Electronics	3 Credits
EEE 493	Field Specialized E.E. Lab. I	1 Credit
EEE 498	Electrical Engineering Project Study	1 Credit
EEE 499	Electrical Engineering Project	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	48 Credits
CPE 791 Dissertation	60 Credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Mabpa, P., Kunthong, J., and Navaratana Na Ayudhya, P. (2021). “Automatic Music Visualizer using Chord Recognition Technique”, *The 2021 International Electrical Engineering Congress (iEECON).* 10-12 March 2021, Pattaya, Thailand, pp. 152-155.
2. Mabpa, P., Kunthong, J., and Navaratana Na Ayudhya, P. (2020). "Clogged Pipe Detection and Monitoring by Using Acoustic Analysis Methodology", *The 17th International Conference on Electrical Engineering/Electronics and Computer*. 24-27 June, Phuket, pp. 177-180.
3. Kunthong, J., Prugsanantanatorn, A., Malee, W., Sritoklin, A., Sapaklom, T., Mujjalinvimut, E., and Navaratana Na Ayudhya, P. (2018). "A Low Cost, Open-Source IoT based 2 - Axis Active Solar Tracker for Smart Communities", *International Conference on Green Energy for Sustainable Development*. 24-26 October, Thavorn Palm Beach Resort Phuket, Phuket, pp. 1-4.

Asst. Prof. Dr. Ekkachai Mujjalinvimut

ผศ. ดร.เอกชัย มุจจลินท์วิมุติ

1. Academic Background

2016 Ph. D. (Electrical and Information Engineering Program), King Mongkut's University of Technology Thonburi, Thailand

2010 M. Eng. (Electrical Engineering), King Mongkut's University of Technology Thonburi, Thailand

2008 B. Eng. (Electrical Engineering), KMUTT, Thailand

2. Teaching Course

2.1 Current Teaching Courses

Graduate Courses

EEE 606 Thesis (Electrical Engineering)	12 credits

Undergraduate Courses

EEE 112 Computer Programming for Electrical Engineers	3 credits
EEE 397 Seminar & Electrical Engineering Mini Project	1 Credit
EEE 498 Electrical Engineering Project Study	1 Credit
EEE 499 Electrical Engineering Project	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Rueangrit, K., Chayavanich, N., Prapanavarat, C., and Mujjalinvimut, E. (2020). Fault Detection and Protection Development while Motor Working with Platform of NETPIE. *SAU Journal of Science & Technology*, *6*(1), pp. 1 - 21.
   In this database: Scopus

International Conference (weight value 0.4)

1. Voottipruex, K., Mujjalinvimut, E., Sangswang, A. and Naetiladdanon, S. (2020). "A Load-Independent Operation of WPT under Frequency Bifurcation for Battery Charging Applications", *The 46th Annual Conference of the IEEE Industrial Electronics Society (IECON 2020)*, Singapore, pp. 2573-2578.
2. Kunthong, J., Prugsanantanatorn, A., Malee, W., Sritoklin, A., Sapaklom, T., Mujjalinvimut, E. and Navarata Na Ayudhya, P. (2018). "A low cost, Open- source IoT based 2-axis active solar tracker for smart communities", *International Conference on Green Energy for Sustainable Development (ICUE 2018)*, 24-26 October, Thavorn Palm Beach Resort, Phuket, Thailand, pp. 1-4.
3. Nutwong, S., Sangswang, A., Naetiladdanon, S., and Mujjalinvimut, E. (2018). "A Novel Output Power Control of Wireless Powering Kitchen Appliance System with Free-Positioning Feature", *Energies 2018*, Vol. 11, Issue. 7, pp. 1-18.

Asst. Prof. Dr. Supakit Chotigo

ผศ. ดร.ศุภกิตติ์ โชติโก

1. Academic Background

2004 Ph.D. (Electrical Engineering and Electronics), University of Manchester Institute of Science and Technology, United Kingdom

2000 M.Sc. (Electrical Engineering and Electronics), University of Manchester Institute of Science and Technology, United Kingdom

1997 B.Eng. (Electrical Engineering), KMUTT, Thailand

2. Teaching Course

2.1 Current Teaching Courses

Graduate Courses

EEE 606	Thesis (Electrical Engineering)	12 Credits

Undergraduate Courses

EEE 110	Electric Circuits	3 Credits
EEE 111	Electric Circuit Analysis	3 Credits
EEE 397	Seminar & Electrical Engineering Mini Project	1 Credit
EEE 452	High Voltage Insulation in Power System Equipment	3 Credits
EEE 493	Field Specialized Electrical Engineering Laboratory I	1 Credit
EEE 494	Field Specialized Electrical Engineering Laboratory II	1 Credit
EEE 498	Electrical Engineering Project Study	1 Credit
EEE 499	Electrical Engineering Project	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Udnan, N., Pattanapakdee K., and Chotigo S. (2020). "Analysis of Spatial Non-uniformity Errors in Integrating Sphere-based Measurement of Total Luminous Flux of Different Beam Angle LED Lamps", *The 12th Conference of Electrical Engineering Network 2020 (EENET 2020)*. Royal Hills Golf Resort & Spa, Nakhon Nayok, Thailand, pp. 1-4.
2. Taecharoen, P., Kunagonniyomrattana, P., and Chotigo, S. (2019). "Development of Dissolved Gas Analysis Analyzing Program using Visual Studio Program", *2019 IEEE PES GTD Asia*. Bangkok, Thailand, pp. 785-790.
3. Pattanapakdee, K., and Chotigo, S. (2019). "Experimental Investigation of Pavement Light Reflection Characteristics in Wet Conditions", *29th CIE SESSION.* Washington D.C., U.S.A., pp. 1790-1795.

Assoc. Prof. Dr. Poj Tangamchit
รศ. ดร.พจน์ ตั้งงามจิตต์

1. Academic Background

2003	Ph.D. (Electrical and Computer Engineering), Carnegie Mellon University, U.S.A.
1997	M.S. (Electrical Computer and Systems Engineering), Rensselaer Polytechnic Institute, U.S.A.
1995	B.Eng. (Electrical Engineering, 1st class honors), KMITT, Thailand

2. Teaching Course

2.1 Current Teaching Courses

- Postgraduate courses

INC	702	Thesis (Control System and Instrumentation Engineering)	12 Credits
INC	701	Thesis (Control System and Instrumentation Engineering)	36 Credits
INC	700	Seminar (Control System and Instrumentation Engineering)	1 Credit
INC	690	Deep Neural Networks and AI	3 Credits
EEE	602	Advances in Electrical Engineering	3 Credits

- Undergraduate courses

INC	121	Electric Circuit Analysis 1	2 Credits
INC	123	Electric Circuit Analysis for AE	3 Credits
INC	141	Computer Programming for INC	3 Credits
INC	281	Capstone Project 1	2 Credits

2.2 Teaching Courses in this Curriculum

CPE	790	Dissertation	48 credits
CPE	791	Dissertation	60 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Laowatanachai, P., and Tangamchit, P. (2020). “Optical-based Limit Order Book Modelling using Deep Neural Networks”, *2020 8th International Electrical Engineering Congress (iEECON 2020)*, 4-6 March, Chiangmai, Thailand, pp. 1-4.
2. Thipprachak, K., and Tangamchit, P. (2019). “Spatio-temporal Model for Limit Order Books in The Stock Exchange of Thailand”, *The 2019 First International Symposium on Instrumentation, Control, Artificial Intelligence, and Robotics (ICA-SYMP 2019),* 16-18 January, Bangkok, Thailand, pp. 1-3.
3. Leangarun, T., Tangamchit, P., and Thajchayapong, S. (2018). “ Stock Price Manipulation Detection using Generative Adversarial Networks”, *IEEE Symposium Symposium Series on Computational Intelligence (SSCI 2018)*, 18-21 November, Bangalore, India, pp. 2104-2111.

Assoc. Prof. Dr. Benjamas Panomruttanarug

รศ.ดร. เบญจมาศ พนมรัตนรักษ์

1. Academic Background

2006 Ph.D. (Electrical Engineering), Columbia University, U.S.A.

2004 M.S. (Electrical Engineering), Columbia University, U.S.A.

1999 B.Eng. (Electrical Engineering), Mahidol University, Thailand

2. Teaching Course

2.1 Current Teaching Courses

- Postgraduate courses

EEE	601	Research Methodology	2 Credits
EEE	602	Advances in Electrical Engineering	3 Credits
EEE	603	Advanced Mathematics for Electrical Engineering	3 Credits
INC	604	Seminar	1 Credits
INC	605	Thesis	12 Credits

- Undergraduate courses

INC	223	Signals and Systems for Automation Engineering Students	3 Credits
INC	331	Control System Design	3 Credits
INC	332	Feedback Control System	3 Credits
INC	471	Control and Instrumentation Engineering Project Study	3 Credits
INC	472	Automation Engineering Project Study	3 Credits
INC	473	Working Integrated Learning I: Project	6 Credits
INC	475	Control and Instrumentation Engineering Project	3 Credits
INC	476	Automation Engineering Project	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790	Dissertation	48 Credits
CPE 791	Dissertation	60 Credits

3. Reasons for being Assigned as a Programme Committee

3.2 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Panomruttanarug, B. (2020). “Position Control of Robotic Manipulator Using Repetitive Control Based-on Inverse Frequency Response Design”, *International Journal of Control, Automation, and Systems*. Vol. 18, No. 11, pp. 2830-2841.
   In this database: Scopus, Web of Science
2. Panomruttanarug, B., Longman, R. W., and M. Q. Phan. (2019). “Steady State Frequency Response Design of Finite Time Iterative Learning Control”, *Journal of Astronautical Sciences*. Vol. 1, No. 1, pp. 1-5.
   In this database: Scopus, Web of Science

International Conference (weight value 0.4)

1. Manangan, J., Panomruttanarug, B., and Yaemglin, T. (2019). “On the Improvement of Variations in Producing Magnetic Heads Using Tracking Control”, *IEEE International Conference on Industrial Technology (ICIT).* 13-15 February 2019, Melbourne, Australia, pp. 15-23.

National Journal (weight value 0.2)

1. Roopyai, P., and Panomruttanarug, B. (2018). “Positioning Error Reduction in Robotic Manipulator SEIKO D-TRAN RT3200 Using Repetitive Control”, *The Journal of King Mongkut’s University of Technology North Bangkok*. Vol28 ., No.2, pp. 299-312.

Assoc. Prof. Dr. Wanchak Lenwari

รศ. ดร.วันจักรี๋ เล่นวารี

1. Acedemic Background

2007 Ph.D. (Electrical and Electronics Engineering), University of Nottingham, England

2000 M.Sc. (Power Electronics and Drives), University of Birmingham, England

1996 B.Eng. (Control System and Instrumentation Engineering), KMITT, Thailand

2. Teaching Course

2.1 Current Teaching Courses

- Postgraduate courses

INC	702	Thesis (Control System and Instrumentation Engineering)	12 Credits
INC	701	Thesis (Control System and Instrumentation Engineering)	36 Credits
INC	700	Seminar (Control System and Instrumentation Engineering)	1 Credit
EEE	602	Advanced in Electrical Engineering	3 Credits

- Undergraduate courses

INC	224	Industrial Electronics	3 Credits
INC	223	Electronics for Automation Systems	3 Credits
INC	331	Industrial Process Measurement	3 Credits
INC	102	Fundamental of Instrumentation and Process Control	3 Credits
INC	252	Digital and Electronics Laboratory for Automation Engineering	1 Credit

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	48 Credits
CPE 791 Dissertation	60 Credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 0.4)

1. Gul, W., Gao, Q., and Lenwari, W. (2020). "Optimal Design of a 5MW Double-Stator Single-Rotor PMSG for Offshore Direct Drive Wind Turbines", *IEEE Transactions on Industry Applications*, Vol.56, No.1, pp. 216-225.

In this database: Scopus, Web of Science

International Conference (weight value 0.4)

1. Gul, W., Gao, Q., and Lenwari, W. (2018). “Optimal Design of a 5MW Double Stator Single Rotor Permanent Magnet Synchronous Generator for Offshore Direct Drive Wind Turbines using the Genetic Algorithm”, *In Proc. International Conference on Electrical Machines and Systems (ICEMS2018)*, 7-10 October, Jeju, Korea, pp. 12-26.
2. Senanon, B., Thongtep, K., Jirasereeamornkul, K., Lenwari, W., Buochareon, S., and Auttawaitkul, Y., (2018). “Performance evaluation of sun tracking photovoltaic system in Thailand”, *The 7th International Conference on Sustainable Energy and Green Architecture (SEGA-07)*, 21-22 May, Bangkok, Thailand, pp. 15-28

National Journal (weight value 0.4)

1. Podumrongchai, K., Lenwari, W., and Yodmanee, K. (2019). “Design and Implementation ProportionalResonant Controller for Single-Phase Shunt Active Power Filter Using Indirect Current Control Technique”, *Engineering Journal Chiang Mai University*, Vol. 23, No. 6, pp. 128-141.
2. Podumrongchai, K., Lenwari, W., and Yodmanee, K. (2018). “Optimization of Proportional-Resonant Controller For Single-Phase Shunt Active Power Filters Based On Indirect Current Control Technique”, *Ladkrabang Engineering Journal*, Vol. 35, No. 2, pp. 41-48

Asst. Prof. Dr. Sudchai Boonto

ผศ. ดร. สุดชาย บุญโต

1. Acedemic Background

2011 Dr.-Ing. (Automatic Control Engineering), Hamburg University of Technology, (TUHH), Germany

2000 M.Sc. (Advanced Control), The University of Manchester Institute of Science and Technology (UMIST), UK

1995 B.Eng. (Electrical Engineering), KMUTT, Thailand

2. Teaching Course

2.1 Current Teaching Courses

- Postgraduate courses

INC 702	Thesis (Control System and Instrumentation Engineering)	12 Credits
INC 701	Thesis (Control System and Instrumentation Engineering)	36 Credits
INC 700	Seminar (Control System and Instrumentation Engineering)	1 Credit
INC 692	Special Topics in Control System and Instrumentation Engineering (Optimal and Robust Control)	3 Credits
INC 693	Special Topics in Control System and Instrumentation Engineering (Dynamics System and Modelling)	3 Credits
EEE 602	Advances in Electrical Engineering	3 Credits

- Undergraduate courses

INC 211	Mathematics for Signals and Systems	3 Credits
INC 102	Fundamental of Instrumentation and Process Control	2 Credits
INC 354	Process Instrumentation Laboratory	1 Credit
INC 341	System Modelling and Analysis	3 Credit
INC 457	Control and Instrumentation Engineering Project Study	1 Credit
INC 458	Control and Instrumentation Engineering Project	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790	Dissertation	36 credits
CPE 791	Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Boonto, S., and Puychaison, S. (2020). "Mouse Type BallBot Identification and Control using a Convex-Concave Optimization", *Journal of Marine Science and Technology Taiwan*, Vol. 28, No. 5, pp. 404–410.
   In this database: Scopus
2. Kenlin, L., Boonto, S., and Nuchkrau, T. (2020). "On-line Self Tuning of Contouring Control for High Accuracy Robot Manipulators under Various Operations", *International Journal of Control, Automation and Systems*, Vol. 18, No. 7, pp. 1818-1828.
   In this database: Scopus

International Conference (weight value 0.4)

1. Kornmaneesang, W., Chen, S.-L., and Boonto, S. (2019). " Contouring Control of a Free-Form Path for a Novel Machining System*", In Proceedings of 2019 First International Symposium on Instrumentation, Control, Artificial Intelligence, and Robotics (ICA-SYMP)*, January, Chulalongkorn University, Bangkok, pp. 1-3.
2. Li, K. & Nuchkrua, T., Boonto, S., and Yuan, Y. (2019). " Sparse Bayesian Learning-Based Adaptive Impedance Control in Physical Human-Robot Interaction", *In Proceedings of 2019 First InternationalSymposium on Instrumentation, Control, Artificial Intelligence, and Robotics (ICA-SYMP 2019),* 16-18 January, Chulalongkorn University, Bangkok, pp. 1-3.
3. Li, K., Nuchkrau, T., Zhao, H., Yuan, Y., and Boonto, S. (2018). " Learning-based Adaptive Robust Control of Manipulated Pneumatic Artificial Muscle Driven by H2-based Metal Hydride" , *In Proceedings of 14th IEEE International Conference on Automation Science and Engineering (CASE 2018)*, 20-24 August, Technical University of Munich Campus, Garching, Germany, pp. 1-3.
4. Sittiarttakorn, V., and Boonto, S. (2018). " Temperature Control and Stabilization of an Industrial Oven", *In Proceedings of the Asia- Pacific Symposium on Applied Electromagnetic and Mechanics (APSAEM 2018),* 24-27 July, Grand Inna Malioboro Hotel, Yogyakarta, Indonesia, pp. 1-3.

Asst. Prof. Dr. Diew Koolpiruck

ผศ. ดร.เดี่ยว กุลพิรักษ์

1. Academic Background

2004 Ph.D. (Systems Engineering), Brunel University, England

2001 M.Eng. (Computer Engineering), KMUTT, Thailand

1997 B.Eng. (Control System and Instrumentation Engineering), KMUTT, Thailand

2. Teaching Course

2.1 Current Teaching Courses

- Postgraduate courses

INC 702 Thesis (Control System and Instrumentation Engineering) 12 Credits

INC 701 Thesis (Control System and Instrumentation Engineering) 36 Credits

INC 700 Seminar (Control System and Instrumentation Engineering) 1 Credit

EEE 602 Advances in Electrical Engineering 3 Credits

- Undergraduate courses

INC 344 Industrial Process Control 3 Credits

INC 363 Industrial network and software3 Credits

INC 444 Integrated systems engineering 3 Credits

INC 364 Manufacturing Execution Systems

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation 48 Credits

CPE 791 Dissertation 60 Credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1 Chantaruk, S., Koolpiruck, D., Chongstitvatana, P. (2021). "Forecasting the quantity and concentration of flocculant in clarification process for sugarcane industry", *ECTI-CON 2021*, pp. 763-767, Article Number 9454878.

2 Sonthitet, P., Koolpiruk, D., and Songkasiri, W. (2019). “Prediction of Production Performance for Tapioca Industry using LSTM neural network”, *ECTI-CON 2019*, 10-13 July, Pattaya, Chonburi, Thailand, pp. 147-150.

3. Phatwong, A., and Koolpiruck, D. (2019). “Kappa Number Prediction of Pulp Digester Using LSTM Neural Network”, *ECTI-CON 2019*, 10-13 July, Pattaya, Chonburi, Thailand, pp. 151-154.

Asst. Prof. Dr. Panuthat Boonpramuk

ผศ. ดร.ภาณุทัต บุญประมุข

1. Academic Background

2004 Ph.D. (Mathematics and Information Sciences), Kanazawa University, Japan

1995 M.Eng. (Electronics Engineering), Kanazawa University, Japan

1992 B.Eng. (Electrical Engineering), KMUTT, Thailand

2. Teaching Course

2.1 Current Teaching Courses

- Postgraduate courses

INC 702	Thesis (Control System and Instrumentation Engineering)	12 Credits
INC 701	Thesis (Control System and Instrumentation Engineering)	36 Credits
INC 700	Seminar (Control System and Instrumentation Engineering)	1 Credit
EEE 602	Advances in Electrical Engineering	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	48 Credits
CPE 791 Dissertation	60 Credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Khrueangsakun, S., Nuratch, S., Boonpramuk, P. (2020). "Design and Development of Cyber Physical System for Real-Time Web-based Visualization and Control of Robot Arm", *5th International Conference on Control and Robotics Engineering (ICCRE)*, 24-26 April, Osaka, Japan, pp. 11–14.
2. Charukwongsawat, S., Nuratch, S., and Boonpramuk, P. (2019). "Design and Development of Multiple Protocols Supported Embedded Gateway for Industrial Networked Electrical Metering Systems", *ECTI-CON 2019*, 10-13 July, Pattaya, Thailand, pp. 1-3.
3. Prempreechakun, N., Nuratch, S., Boonpramuk, P. (2019). "Automatic Sampling Time Adaptation for Networked Digital Controller based-on Embedded System", *ICA-SYMP 2019*, 16-18 January, Bangkok, Thailand, pp. 1-3.

Asst. Prof. Dr. Sarawan Wongsa

ผศ. ดร.ศราวัณ วงษา

1. Acedemic Background

2007	Ph.D. (Automatic Control and Systems Engineering), University of Sheffield, England
2002	M.Sc. (Automatic Control and Systems Engineering), University of Sheffield, England
1998	B.Eng. (Control Systems and Instrumentation Engineering), KMUTT, Thailand

2. Teaching Course

2.1 Current Teaching Courses

- Postgraduate courses

INC 702	Thesis (Control System and Instrumentation Engineering)	12 Credits
INC 701	Thesis (Control System and Instrumentation Engineering)	36 Credits
INC 700	Seminar (Control System and Instrumentation Engineering)	1 Credit
EEE 602	Advances on Electrical Engineering	3 Credits

- Undergraduate courses

INC 212	Signals & Systems	3 Credits
INC 341	Feedback Control Systems	3 Credits
INC 351	Instrumentation and Control Systems Practice	1 Credit
INC 354	Process Instrument laboratory	1 Credits
INC 441	Automation System Technology	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Pratvittaya, J., and Wongsa, S. (2020). "A BIC-based Refined Piecewise-linear Hammerstein Identification for Valve Stiction Pilot Plant", *SICE Annual Conference 2020 (SICE 2020)*, 23-26 September, National Taiwan Ocean University, Keelung, Taiwan, pp. 1713-1718.

2. Wongsa, S., and Kowkasai, N. (2020). “Deep Deterministic Policy Gradient for Magnetic Levitation Control”, *The 7th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON)*, 24-27 June, Virtual Conference Hosted by College of Computing, Prince of Songkla University, Thailand, pp. 796-799.
3. Pratvittaya, J., and Wongsa, S. (2019). “Identification of Valve Stiction in Control Loops Using Refined Piecewise-Linear Hammerstein Models”, *The 2019 International Automatic Control Conference (CACS)*, 13-16 November, National Taiwan Ocean University, Keelung, Taiwan, pp. 1-6.
4. Dechrudee, W., Wongsa, S., Chen, S.L. (2018). “A Soft Sensor for Prediction of Temperature Rises on a Ball Screw Shaft Using Extreme Learning Machine”, *The 2018 International Electrical Engineering Congress (iEECON2018),* 7-9 March, Krabi, Thailand, pp. 1-3.

Asst. Prof. Dr. Santi Nuratch

ผศ. ดร.สันติ นุราช

1. Acedemic Background

2012 Ph.D. (Electrical and Computer Engineering), King Mongkut's University of Technology Thonburi, Thailand

2009 M.Sc. (Control System and Instrumentation Engineering; Electrical Engineering), King Mongkut's University of Technology Thonburi, Thailand

2007 B.Eng. (Control System and Instrumentation Engineering), King Mongkut's University of Technology Thonburi, Thailand

2. Teaching Course

2.1 Current Teaching Courses

- Graduate courses

INC	702	Thesis (Control System and Instrumentation Engineering)	12 Credits
INC	701	Thesis (Control System and Instrumentation Engineering)	36 Credits
INC	700	Seminar (Control System and Instrumentation Engineering	1 Credit
EEE	602	Advanced in Electrical Engineering	3 Credits

- Undergraduate courses

INC	222	Logic Theory and Digital Circuit Design	3 Credits
INC	252	Digital and Electronics Laboratory II	3 Credits
INC	361	Microprocessor and Applications	3 Credits
INC	451	Process Control Laboratory	1 Credit
INC	457	Control System and Instrumentation Engineering Project Study	1 Credit

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Charukwongsawat, S., Nuratch, S., and Boonpramook, P. (2019). “Design and Development of Multiple Protocols Supported Embedded Gateway for Industrial Networked Electrical Metering Systems”, *ECTI-CON 2019*, 10-13 July, Pattaya, Thailand, pp. 20-37.
2. Mee-im, K., Nuratch, S., and Lenwari, W. (2019). “Design and Development of Embedded Networked Wireless Digital Controller for Multiple Plants using Bit-Representation Data Formation”, *ECTI-CON 2019*, 10-13 July, Pattaya, Thailand, pp. 84-97.
3. Eamnapha, N., Nuratch, S., and Lenwari, W. (2019). “The Graphics and Physics Engines for Rapid Development of 3D Web-based Applications”, *ECTI-CON 2019*, 10-13 July, Pattaya, Thailand, pp. 60-84.
4. Prempreechakun, N., Nuratch, S., and Boonpramook, P. (2019). “Automatic Sampling Time Adaptation for Networked Digital Controller based-on Embedded System”, *ICA-SYMP 2019*, 16-18 January, Bangkok, Thailand, pp. 98-110.
5. Nuratch, S. (2018). “Applying the MQTT Protocal on Embedded System for Smart Sensors / Actuators and IoT Application”, *ECTI-CON 2018*, 18-22 July, Chiang Rai, pp. 15-29.

Dr. Issarapong Khuankrue

ดร.อิสสระพงศ์ ค้วนเครือ

1. Academic Background

2018 Dr.Eng (Electronics, Information and Media Engineering), Nippon Institute of Technology, Japan

2012 M.Sc. (Software Engineering), Chulalongkorn University, Thailand

2009 B.S. (Information Technology), Kasetsart University, Thailand

2. Teaching Course

2.1 Current Teaching Courses

- Postgraduate courses

EEE	602	Advances in Electrical Engineering	3 Credits
INC	604	Seminar	1 Credit
INC	605	Thesis	12 Credits

- Undergraduate courses

INC	242	Data Structures and Algorithms	3 Credits
INC	251	Programmable Logic Control	3 Credits
INC	261	Data Management	3 Credits
INC	362	Introduction of Data Science for Automation	3 Credits
INC	372	Mini- Project II for Automation Engineer Students	3 Credits
INC	473	Working Integrated Learning I: Project	6 Credits
INC	475	Control and Instrumentation Engineering Project	3 Credits
INC	476	Automation Engineering Project	3 Credits

2.2 Teaching Courses in this Curriculum

CPE 790	Dissertation	48 Credits
CPE 791	Dissertation	60 Credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program’s field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Leangarun, T. and Khuankrue, I. (2021). "A Study on Effect of Generic Management Skills on Logical Thinking Skills in Systems Engineering Exploration, *2021 IEEE Global Engineering*

Education Conference (EDUCON), 21-23 April, Vienna, Austria, pp. 968-972, Article Number 9453950.

2. KammuangT., Luealamai, W., and Khuankrue, I. (2021). "Data-Driven Model for Failure Analysis of Internet of Things Devices: A Preliminary Study", *The 2nd International Symposium on Instrumentation, Control, Artificial Intelligence, and Robotics*, 20-23 January, Bangkok, Thailand, pp. 1-4.
3. Khuankrue, I., Boonto, S. and Tsujimura, Y. (2020). "Modeling the Material -Inventory Transportation Problem Using Multi-objective Optimization, *The 59th Annual Conference of the Society of Instrument and Control Engineers of Japan (SICE),* 23-26 Sepember, Chiang Mai, Thailand, pp. 1-5.

Dr. Chanchai Techawatcharapaikul

ดร.ชาญชัย เตชะวัชราภัยกุล

1. Academic Background

2019 D.Eng. (Electrical and Information Engineering Technology) King Mongkut's University of Technology Thonburi, Thailand

2003 M.Eng. (Electrical Engineering), King Mongkut's University of Technology Thonburi, Thailand

1997 B.Eng. (Electrical Engineering), King Mongkut's Institute of Technology Thonburi, Thailand

2. Teaching Course

2.1 Current Teaching Courses

Undergraduate Courses

EEE 100	Electrotechnology (Power)	3 Credits
EEE 102	Electrotechnology I (Power)	3 Credits
EEE 392	Fundamental Electrical Engineering Laboratory II	1 Credit
EEE 393	Electrical Engineering Laboratory II	1 Credit
EEE 394	Electrical Engineering Laboratory III	1 Credit
EEE 397	Seminar and Electrical Engineering Mini Project	1 Credit
EEE 498	Electrical Engineering Project Study	1 Credit
EEE 499	Electrical Engineering Project	3 Credits

Graduate Courses

EEE 606	Thesis	12 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Journal (weight value 1)

1. Sonkaeo, P. and Techawatcharapaikul, C. (2021). “Hydrophobicity Class of Porcelain Insulators base on method of Contact Angle via Image Processing”, *International Journal of Electrical, Electronics and Data Communication (IJEEDC)*. Vol. 9, Issue. 1, pp. 12-15.
   In the database: http://ijeedc.iraj.in/paper_detail.php?paper_id=17736
2. Sonkaeo, P. and Techawatcharapaikul, C. (2021). “Hydrophobicity Class of Porcelain Insulators based on Information Image Feature Extraction Via Image Processing”, *International Journal of Industrial Electronics and Electrical Engineering (IJIEEE)*, Vol. 9, Issue. 1, pp. 12-15.
   In the database: http://ijieee.org.in/volume.php?volume_id=717

International Conference (weight value 0.4)

1. Sonkaeo, P. and Techawatcharapaikul, C. (2021). “The Hydrophobicity Class of Porcelain Insulator Detection Based on Digital Image Processing: A Paper Review”, 2021 *IEEE 18th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON 2021),* Chiang Mai, Thailand, 19-22 May, pp. 759-762.
2. Rangdang, W., and Techawatcharapaikul, C. (2021). “The Application of Compressing Speaker Frequency Control for Cancelling the Air-Vortex Turbulence from Trucks Causing Unbalance to Motorcycle”, *2021 IEEE 18th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON 2021)*, Chiang Mai, Thailand, 19-22 May 2021, pp. 1100-1103.
3. Wongthong, Y., Rattanapanyalert, T., Supopat, T. andTechawatcharapaikul, C. (2021). "A DESIGN OF ENERGY STORAGE SYSTEM FOR ELECTRIC LOCOMOTIVE", *2021 International Electrical Engineering Congress (iEECON2021)*. Pattaya, Chonburi, 10 – 12 March 2021, pp. 149-152.
4. Supopat, T., Rattanapanyalert, T., Wongthong, Y. and Techawatcharapaikul, C. (2021). "A DESIGN OF HEAT SINK FOR LITHIUM-ION BATTERY PACK", *2021 International Electrical Engineering Congress (iEECON2021)*. Pattaya, Chonburi, 10-12 March, pp. 165-168.
5. Khunsamitpanya, R., Yotsongpol, R., Srichanpliuw, S. and Techawatcharapaikul, C. (2021). "The Energy Meter Translation by Optical Character Recognition Technique", *2021 International Electrical Engineering Congress (iEECON2021)*. Pattaya, Chonburi, 10-12 March, pp. 412-41.

6. Phaenkongngam, T., Chinnawong, K., Patumasuit, N. and Techawatcharapaikul, C. (2021). "Reviewing Propulsion & Levitation System For Magnetic Levitation Train", *2021 International Electrical Engineering Congress (iEECON2021)*. pp. 185-188, doi: 10.1109/iEECON51072.2021.9440283.
7. Sonkaeo, P. and Techawatcharapaikul, C. (2020). "Hydrophobicity Class of Porcelain Insulators base on method of Contact Angle via Image Processing", *International Conference On Electrical and Electronics Engineering (ICEEE)*, pp. 7-10.
8. Sonkaeo, P. and Techawatcharapaikul, C. (2020). "Hydrophobicity Class of Porcelain Insulators based on Information image feature extraction via Image Processing", *International Conference On Electrical and Electronics Engineering (ICEEE)*, pp. 11-14.

Dr. Supapong Nutwong

ดร.สุภาพงษ์ นุตวงษ์

1. Academic Background

2019	D.Eng. (Electrical and Information Engineering Technology) King Mongkut's University of Technology Thonburi, Thailand
2011	M.Eng. (Electrical Engineering), King Mongkut's University of Technology Thonburi, Thailand
2007	B.Eng. (Electrical Engineering), King Mongkut's University of Technology Thonburi, Thailand

2. Teaching Course

2.1 Current Teaching Course

Undergraduate Courses

EEE 100	Electrotechnology (Power)	3 credits
EEE 102	Electrotechnology I (Power)	3 credits
EEE 397	Seminar and Electrical Engineering Mini Project	1 credit
EEE 498	Electrical Engineering Project Study	1 credit
EEE 499	Electrical Engineering Project	3 credits

Graduate Courses

EEE 606	Thesis	12 Credits

2.2 Teaching Courses in this Curriculum

CPE 790 Dissertation	36 credits
CPE 791 Dissertation	48 credits

3. Reasons for being Assigned as a Programme Committee

3.1 Qualification and filed of study corresponds with the program's field of study

3.2 Recent Publication (in the past 5 years)

International Conference (weight value 0.4)

1. Nutwong, S., Mujjalinvimut, E., Tricharoenlap, T., Siripatcharaphan, K. and Thaewjan, W. (2021). "Comparison of Figure of Merit of Different Circular Coil Used in Inductive Power Transfer System", *The 2021 International Electrical Engineering Congress (iEECON)*. Pattaya, Thailand, pp. 169-172.

2. Nutwong, S., Mujjalinvimut, E., Maiket, S., Khemkhaeng, T. and Wiraphonsawan, N., (2021). “Position Detection with Online Monitoring System for Wireless Charging of Electric Vehicles”, *The 2021 International Electrical Engineering Congress (iEECON)*. Pattaya, Thailand, pp. 173-176.
3. Nutwong, S., Sangswang, A. and Naetiladdanon, S. (2020). “Comparative Analysis of the Reactive Power Compensation Topology for Wireless Powering Electric Kettle”, *The 14th South East Asian Technical University Consortium (SEATUC 2020)*. Bangkok, Thailand, pp. 293-297.
4. Vienglek, P., Nutwong, S., Sangswang, A., Naetiladdanon, S. and Mujjalinvimut, E. (2020), “Comparative Study of Magnetically Coupled Coil Used in Dynamic Wireless Battery Charger for Electric Vehicles”, *The 23rd International Conference on Electrical Machines and Systems (ICEMS 2020)*. Hamamatsu, Japan, pp. 1775-1778.

Appendix D Order of Programme Revision Committee

คำสั่งคณะวิศวกรรมศาสตร์
มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าธนบุรี
ที่ 53/2564
เรื่อง แต่งตั้งคณะกรรมการปรับปรุงหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาวิศวกรรมไฟฟ้าและคอมพิวเตอร์ (หลักสูตรนานาชาติ) หลักสูตรปรับปรุง พ.ศ. 2565

ตามที่ คณะกรรมการประจำคณะวิศวกรรมศาสตร์ ในการประชุมครั้งที่ 2/2564 เมื่อวันที่ 9 กุมภาพันธ์ 2564 และวันที่ 20 เมษายน 2564 ได้พิจารณาให้ความเห็นชอบการแต่งตั้งคณะกรรมการปรับปรุงหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาวิศวกรรมไฟฟ้าและคอมพิวเตอร์ (หลักสูตรนานาชาติ) หลักสูตรปรับปรุง พ.ศ. 2565 และสภาวิชาการ ในการประชุม ครั้งที่ 5/2564 เมื่อวันที่ 17 พฤษภาคม 2564 ได้ให้ความเห็นชอบผู้ทรงคุณวุฒิภายนอก แล้วนั้น

คณะวิศวกรรมศาสตร์ จึงขอแต่งตั้งคณะกรรมการปรับปรุงหลักสูตรดังกล่าว ดังรายนามต่อไปนี้

1. รศ. ดร.นฤมล วัฒนพงศกร ประธานคณะกรรมการ
   อาจารย์ผู้รับผิดชอบหลักสูตร
2. ศ. ดร.เดวิด บรรเจิดพงศ์ชัย ผู้ทรงคุณวุฒิภายนอก (ด้านวิชาการ)
   ตำแหน่ง ศาสตราจารย์
   สังกัด ภาควิชาวิศวกรรมไฟฟ้า คณะวิศวกรรมศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
3. ศ. ดร.ธนารักษ์ ธีระมั่นคง ผู้ทรงคุณวุฒิภายนอก (ด้านวิชาการ)
   ตำแหน่ง ศาสตราจารย์
   สังกัด ภาควิชาเทคโนโลยีสารสนเทศ คอมพิวเตอร์และการสื่อสาร
   สถาบันเทคโนโลยีนานาชาติสิรินธร
4. คุณพัฒนา แสงศรีโรจน์ ผู้ทรงคุณวุฒิภายนอก (ด้านอุตสาหกรรมและผู้ใช้บัณฑิต)
   ตำแหน่ง ที่ปรึกษา รัฐมนตรีว่าการกระทรวงพลังงาน
   สังกัด กระทรวงพลังงาน
5. ผศ. ดร.อัครา ประโยชน์ ผู้ทรงคุณวุฒิภายนอก (ด้านวิชาการและผู้ใช้บัณฑิต)
   ตำแหน่ง ผู้ช่วยศาสตราจารย์ / หัวหน้าภาควิชาวิทยาการคอมพิวเตอร์และสารสนเทศ
   สังกัด ภาควิชาวิทยาการคอมพิวเตอร์และสารสนเทศ
   คณะวิทยาศาสตร์ประยุกต์ มหาวิทยาลัยเทคโนโลยีพระจอมเกล้าพระนครเหนือ
6. ผศ. ดร.สุเมธ เนติลัดดานนท์ กรรมการ
   อาจารย์ผู้รับผิดชอบหลักสูตร
7. รศ. ดร.เบญจมาศ พนมรัตน์รักษ์ กรรมการ
   อาจารย์ผู้รับผิดชอบหลักสูตร
8. ผศ. ดร.วีรพล จิรจริต กรรมการและเลขานุการ
   อาจารย์ผู้รับผิดชอบหลักสูตร

สั่ง ณ วันที่ 24 พฤษภาคม พ.ศ.2564

(ศ. ดร.ชัย จาตุรพิทักษ์กุล)
คณบดีคณะวิศวกรรมศาสตร์

Appendix E KMUTT Regulations on Graduate Studies of the Year 2019 (2562 B.E.) and the Affiliation's Educational Announcements/Regulations

1

The Regulations of King Mongkut's University of Technology Thonburi on Graduate Studies

B.E. 2562 (2019)

Whereas it is deemed expedient to revise the Regulations of King Mongkut's University of Technology Thonburi on Graduate Studies, B.E. 2547 (2004) for compliance with the Outcome-Based Education management system and the Office of the Higher Education Commission's Standard Criteria for Graduate Program, B.E. 2558 (2015).

By virtue of Clause 18 (2) of the King Mongkut's University of Technology Thonburi Act, B.E. 2541 (1998) in conjunction with the resolution passed by the University Council at Meeting No. 234 on 6 February 2019, the University Council hereby establishes these regulations as follows:

Section 1 General Provisions

Clause 1 The present regulations are called "The Regulations of King Mongkut's University of Technology Thonburi on Graduate Studies, B.E. 2562 (2019)".

Clause 2 The present regulations shall come into force from the first semester of the 2019 Academic Year onward.

Clause 3 The following regulations shall be repealed:

3.1 The Regulations of King Mongkut's University of Technology Thonburi on Graduate Studies, B.E. 2547 (2004);

3.2 2 The Regulations of King Mongkut's University of Technology Thonburi on Graduate Studies (No.2), B.E. 2553 (2010);

3.3 3 The Regulations of King Mongkut's University of Technology Thonburi on Graduate Studies (No. 3), B.E. 2555 (2012);

3.4 4 The Regulations of King Mongkut's University of Technology Thonburi on Graduate Studies (No. 4), B.E. 2556 (2013);

3.5 5 The Regulations of King Mongkut's University of Technology Thonburi on Graduate Studies (No. 5), B.E. 2559 (2016);

36 6 The Regulations of King Mongkut's University of Technology Thonburi on Graduate Studies (No. 6), B.E. 2559 (2016);

37 The Regulations of King Mongkut's University of Technology Thonburi on Doctoral Studies for Part-time Students, B.E. 2547 (2004);

38 The Regulations of King Mongkut's University of Technology Thonburi on the Transfer of Knowledge, Skills and Experiences for Graduate Studies, B.E. 2549 (2006).

All existing regulations, directives, announcements or resolutions that are contrary to or inconsistent with the present regulations shall be superseded by this regulations.

Clause 4 In the present regulations,

"University" means King Mongkut's University of Technology Thonburi;

"University Council" means the University Council of King Mongkut's University of Technology Thonburi;

"Academic Council" means the Academic Council of King Mongkut's University of Technology Thonburi;

"Chairman of the University Council" means the Chairman of the University Council of King Mongkut's University of Technology Thonburi;

"President" means the President of King Mongkut's University of Technology Thonburi;

"Graduate studies" means the educational management at the graduate diploma, master's degree, higher graduate diploma, and doctoral degree levels of King Mongkut's University of Technology Thonburi;

"Faculty" means the faculties, institutes, bureaus or work units of any other name that are equivalent in status to a faculty that offer graduate programs of study and are affiliated with King Mongkut's University of Technology Thonburi;

"Faculty committee" means the administrative committee of a faculty, institute, bureau or a work unit of any other name that is equivalent in status to a faculty;

"Department" means the departments or work units of any other name that are equivalent in status to a department that offer graduate programs of study and are affiliated with King Mongkut's University of Technology Thonburi;

"Program" means the graduate programs that are offered with the approval of the University Council of King Mongkut's University of

Technology Thonburi;

"Dean" means the deans of the faculties or work units of any other name with that are equivalent in status to a faculty that offer graduate programs of study and are affiliated with King Mongkut's University of Technology Thonburi;

"Director" means the directors of an institute or work unit of any other name that is equivalent in status to a faculty that offers graduate programs of study and are affiliated with King Mongkut's University of Technology Thonburi;

"Credit" means the unit used to indicate the amount of learning;

"Program responsible faculty member" means a program faculty member who are responsible for developing and managing a graduate program and its instruction, including the planning, quality control, monitoring, evaluation and development of such program. A program responsible faculty member must be in charge of the program throughout program implementation. Such faculty member cannot be concurrently responsible for more than one program, except in the case of multi-disciplinary or inter-disciplinary programs or concurrent master's and doctoral degree programs where a program responsible faculty member can be responsible for another program. However, no more than two faculty members who are responsible for more than one program can be the program responsible, faculty members in a the same program.

"Regular faculty member" means an official and employee in the academic strand (A), a civil servant in a higher education institution who holds an academic rank of Assistant Professor, Associate Professor and Professor as well as an associate official of King Mongkut's University of Technology Thonburi who has been assigned the tasks of fulfilling the higher education missions on a full-time basis.

"Program faculty member" means a regular faculty member who has direct or related academic qualifications in the program's discipline whose

duties are to teach and conduct research in the said discipline. A program faculty member can concurrently be responsible for several programs provided that he/she has the academic qualifications in the direct or related discipline of the program.

"Associate official" means an individual who is not affiliated with King Mongkut's University of Technology Thonburi but performs academic duties, conducts research, establishes relationship with individuals and organizations at both domestic and international levels as well as performs other duties as assigned by the University.

"Special instructor" means an instructor who is not a regular faculty member but is assigned by the program responsible faculty members to teach no more than 50 percent of total course time.

"External expert" means an individual from outside King Mongkut's University of Technology Thonburi, who has been appointed a thesis/ dissertation co-advisor, independent study co-advisor, member of a thesis/dissertation examination committee or any other types of examination committee.

"Course responsible faculty member" means a program faculty member whose duties are to teach, prepare instructional plan, supervise program quality control and evaluate the course under his/her responsibility.

"Transfer Equivalency Committee" means the committee responsible for the transfer equivalency of knowledge, skills and experiences as well as credits for courses in the non-formal and informal educational systems.

Clause 5 The President shall have charge and control of the present regulations. In case of problems with their execution, the President shall have the final decision and the President's judgement or directive shall be final.

Section 2 Academic system

Clause 6 Academic System

A semester system in which an academic year is divided into two regular semesters of no less than 15 weeks each. A special semester may be held as deemed necessary by individual faculty.

4

The instruction period and course credits permitted in a special semester shall be proportionally equivalent to those of a regular semester.

Clause 7 Credit calculation

Determination of the number of credits for each course is based on the following criteria:

7.1 A theoretical course with no less than 15 hours of lecture or problem discussion or other activities to promote course comprehension per regular semester is assigned an equivalent of 1 course credit;

7.2 2 A practical course with no less than 30 hours of training or laboratory sessions in each regular semester is assigned an equivalent of 1 course credit;

7.3 3 An internship or field practice course of no less than 45 hours of training per regular semester is assigned an equivalent of 1 course credit;

7.4 A project or work assignment that takes no less than 45 hours per regular semester to complete is assigned an equivalent of 1 course credit;

7.5 5 A thesis/dissertation or independent study course with a study or research period of no less than 45 hours per regular semester is assigned an equivalent of 1 course credit.

Clause 8 Program structure

81 1 Graduate diploma program – a total of no less than 24 course credits for the entire program.

82 Higher graduate diploma program – a total of no less than 24 course credits for the entire program.

83 Master's degree program – a total of no less than 36 course credits for the entire program. Two study plans are available:

8.3.1 Plan A is a research-focused and thesis program divided into 2 types:

Type A 1 is a thesis-only program requiring no less than an equivalent academic work of 36 course credits. Additional non-credit courses or academic activities in which students are required by the program to obtain specific academic achievement may be prescribed.

Type A 2 is a thesis-oriented program requiring no less than an equivalent academic work of 12 credits. Students must also complete all courses prescribed by the program.

8.3.2 Plan B is a coursework-focused program with no thesis. However, students are required to conduct no less than 3 course credits but no more than 6 course credits of independent study or its equivalent.

A choice of Plan A or Plan B program depends on the decision of individual student at the discretion of the program responsible faculty members. The faculty must be notified of the student's plan of study as well as the number of course credits specified in Clause 8.3.1 and Clause

8.3.2, excluding course credits earned for the English foundation course and other foundation courses.

8.4 Doctoral degree program is a research-focused program aims to cultivate academics and professionals with advanced knowledge in a specific discipline. The program is divided into two types:

8.4.1 Type 1 is a research-focused program requiring students to produce a dissertation that generates new knowledge. The program may require students to take additional, non-credit coursework or academic activities and to obtain specific academic achievement as follows:

(1) Type 1.1 – students who hold a master's degree must complete no less than 48 credits of dissertation work;

(2) Type 1.2 – students who hold a bachelor's degree must complete no less than 72 credits of dissertation work;

Students admitted to Clause 8.4.1(1) and Clause 8.4.1(2) program must graduate with the same quality and standard of education.

8.4.2 Type 2 is a research-focused plan that requires students to produce a dissertation of high quality capable of making academic and professional advancement. They are also required to take additional courses as follows:

(1) Type 2.1 – students who hold a master's degree must complete no less than 36 credits of dissertation work and 12 credits of coursework;

(2) Type 2.2 – students who hold a bachelor's degree must complete no less than 48 credits of dissertation work and 24 credits of coursework;

Students admitted to a program under Clause 8.4.1(1) and Clause 8.4.1(2) program must graduate with the same quality and standard of education.

Clause 9 The number and qualifications of graduate program responsible faculty members and graduate program faculty members shall be in accordance with the criteria prescribed by the University.

Section 3 Faculty members

Clause 10 Number, academic qualifications and other qualifications of program faculty members

10.1 Graduate diploma program

10.1.1 Program faculty members must hold at least a master's degree or its equivalent and must have at least three academic works, which are not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years. At least one of such works must be based on the results of a research work.

For professional graduate diploma programs, program faculty members must have the qualifications that meet the professional standards of such profession.

10.1.2 At least five of the program responsible faculty members must hold a doctoral degree or its equivalent or at least a master's degree or its equivalent and an academic rank of Associate professor. They must have at least three academic works, which are not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years. At least one of such works must be based on the results of a research work.

In the case where it is imperative for a discipline in which the required number of program responsible faculty members cannot be met or for a program with less than 10 students, the Faculty shall submit the number and academic qualifications of existing program responsible faculty members to the University Council for suitability consideration and to the Higher Education Commission for consideration on a case-by-case basis.

10.1.3 Course instructors must be a regular faculty member or a special instructor who holds at least a master's degree or its equivalent in the specific or related discipline of the program or in the discipline of the course that they teach. They must also have previous teaching experience and at least one academic work, which is not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years.

In case of special instructors, the master's degree requirement may be exempted but they must hold at least a bachelor's degree or its equivalent and have no less than

six years of work experience related to the course that they teach. However, special instructors must teach no more than 50 percent of total course time.

In case of professional graduate diploma programs, course instructors must have the qualifications that meet the professional standards of such profession.

10.2 Higher graduate diploma program

10.2.1 Program faculty members must hold a doctoral degree or its equivalent or at least a master's degree or its equivalent and an academic rank of Associate Professor. They must have at least three academic works, which are not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years. At least one of works must be based on the results of a research work.

In case of professional higher graduate diploma programs, program faculty members must have the qualifications that meet the professional standards of such profession.

10.2.2 At least five of the program responsible faculty members must hold a doctoral degree or its equivalent or at least a master's degree or its equivalent and an academic rank of Professor. They must also have at least three academic works, which are not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years. At least one of such works must be based on the results of a research work.

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In the case where it is imperative for a discipline in which the required number of program responsible faculty members cannot be met or for a program with less than 10 students, the Faculty shall submit the number and academic qualifications of existing program responsible faculty members to the University Council for suitability consideration and to the Higher Education Commission for consideration on a case-by-case basis.

10.2.3 Course instructors must be a regular faculty member or a special instructor who holds a doctoral degree or at least a master's degree or its equivalent in the specific or related discipline of the program or in the discipline of the course that they teach. They must also have previous teaching experience and at least one academic work, which is not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years.

In case of special instructors, the doctoral degree qualification requirement may be exempted but they must hold at least a master's degree or its equivalent and have no less than four years of work experience related to the course that they teach. However, special instructors must teach no more than 50 percent of total course time.

In case of professional higher graduate diploma programs, program faculty members must have the qualifications that meet the professional standards of such profession.

In case of professional graduate diploma programs, course instructors must have the qualifications that meet the professional standards of such profession.

10.3 Master's degree program

10.3.1 Program faculty members must hold at least a master's degree or its equivalent and must have at least three academic works, which are not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years. At least one of such works must be based on the results of a research work.

10.3.2 At least three of the program responsible faculty members must hold a doctoral degree or its equivalent or at least a master's degree or its equivalent and an academic rank of Associate Professor. They must also have at least three academic works, which are not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years. At least one of such works must be based on the results of a research work.

In the case where it is imperative for a discipline in which the required number of program responsible faculty members cannot be met or for a program with less than 10 students, the Faculty shall submit the number and academic qualifications of existing program responsible faculty members to the University Council for suitability consideration and to the Higher Education Commission for consideration on a case-by-case basis.

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10.3.3 There are two types of thesis and Independent Study advisors as follows:

1) Thesis and independent study principal advisors must be a program faculty members who holds a doctoral degree or its equivalent or at least a master's degree or its equivalent and an academic rank of Associate Professor. They must also have at least three academic works, which are not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years. At least one of such works must be based on the results of a research work.

2) Thesis co-advisors (if any) must have the academic qualification and other qualifications as follows:

Thesis co-advisors who are a regular faculty member must have the same academic qualification and academic works as the principal thesis advisors.

Thesis co-advisors who are an external expert must hold a doctoral degree or its equivalent and have no less than ten academic works, which are directly or closely related to the thesis or independent study topic, published in a journal listed in a nationally recognized database or have no less than five academic works, which are directly or closely related to the thesis topic, published in a journal listed in an internationally recognized database.

External experts who do not meet the above academic qualification and academic work requirements, must be a person of highly recognized knowledge, expertise and experience, directly or closely related to the thesis or independent study topic, who have the approval of the University Council. The Higher Education Commission must be informed.

10.3.4 A thesis/independent committee shall have the duties of providing advices and assessing thesis/independent study progress. The Committee shall consist of:

1) a principal thesis advisor;

2) a thesis co-advisor(s) (if any);

3) a program faculty member(s);

4) a expert member(s) (if any).

The combined number of Clause 3) and Clause 4) committee members must not be less than the number of thesis advisor(s).

10.3.5 Thesis examiners or independent study examination committee shall have the duties of deliberating student's research competency, comprehensive knowledge in the research topic, written and oral presentation ability as well as intellectual ability and resourcefulness in answering examiners' questions. The Committee shall consist of:

1) a principal thesis advisor;

2) a thesis co-advisor(s) (if any);

3) a program faculty member(s);

4) a expert member(s).

The combined number of Clause 3) and Clause 4) examiners must not be less than the number of thesis advisor(s) and the combined number of thesis examiners must not be less than three persons. Chairperson of the thesis examination committee must not be the principal thesis advisor or co-advisor. Thesis examiners must be appointed by the Faculty Committee and must have the academic qualification, qualifications and academic works as follows:

Thesis examiners who are program faculty members must hold a doctoral degree or its equivalent or at least a master's degree or its equivalent and an academic rank of Associate Professor. They must also have at least three academic works, which are not a part of

their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years. At least one of such works must be based on the results of a research work.

Thesis examiner who are an external expert must hold a doctoral degree or its equivalent and have no less than ten academic works, which are directly or closely related to the thesis or independent study topic, published in a journal listed in nationally recognized databases or have no less than five academic works, which are directly or closely related to the thesis topic, published in a journal listed in an internationally recognized database or have the required qualifications for a dissertation examiner.

Thesis examiners who are a foreign expert may be allowed to have the thesis sent to them for reading and comments.

External experts who do not meet the above academic qualification and academic work requirements, must be a person of highly recognized knowledge, expertise and experiences, which are directly or closely related to the thesis/independent study topic, who have the approval of the University Council. The Higher Education Commission must be informed.

10.3.6 Comprehensive examination examiners

10.3.6.1 Qualifications

(1)) Must be a person who holds a doctoral degree or its equivalent or an academic rank not lower than Associate Professor in a specific or related discipline of the program;

(2) Have experiences in conducting researches which are not a part of their study toward a degree.

10.3.6.2 Composition

A comprehensive examination committee shall consist of a chairperson and three committee members who are appointed by the Faculty Committee. It must have at least three members.

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(1) Chairperson of a comprehensive examination committee must hold a doctoral degree or its equivalent or hold an academic rank not lower than Associate Professor in the specific or related discipline of the program.

(2) An external expert or the University's associate official may be invited to be a member or chairperson of a comprehensive examination committee.

10.3.6.3 Duties

It is the duties of the examiners to conduct a written or oral examination in a specific discipline to assess the comprehensive academic knowledge of Plan B master's degree students.

10.3.7 Course instructors must be a regular faculty member or a special instructor who holds at least a master's degree or its equivalent in the specific or related discipline of the program or in the discipline of the course that they teach. They must also have teaching experiences and at least one academic work, which is not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years.

Special instructors must teach no more than 50 percent of total course time.

10.4 Doctoral degree programs

10.4.1 Program faculty members must hold a doctoral degree or its equivalent or at least a master's degree or its equivalent and an academic rank of Associate Professor. They must also have at least three academic works, which are not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years. At least one of such works must be based on the results of a research work.

10.4.2 At least three of the program responsible faculty members must hold a doctoral degree or its equivalent or at least a master's degree or its equivalent and an academic rank of Professor. They must also have at least three academic works, which are not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years. At least one of such works must be based on the results of a research work.

In the case where it is imperative for a discipline in which the required number of program responsible faculty members cannot be met or for a program with less than 10 students, the Faculty shall submit the number and academic qualifications of existing program responsible faculty members to the University Council for suitability consideration and to the Higher Education Commission for consideration on a case-by-case basis.

10.4.3 .3 Dissertation advisors shall have the duties of providing advice and consultation to students on theories, concepts, research methods and the writing of a dissertation. There are two types of dissertation advisor as follows:

1) Principal dissertation advisors must be a program faculty member who holds a doctoral degree or its equivalent or at least a master's degree or its equivalent and an academic

rank of Associate Professor. They must also have at least three academic works, which are not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years. At least one of such works must be based on the results of a research work.

2) Dissertation co-advisors (if any) must have the academic qualification and qualifications as follows:

Dissertation co-advisors who are a regular faculty member must have the same academic qualification and academic works as the principal dissertation advisors.

Dissertation co-advisors who are an external expert must hold a doctoral degree or its equivalent and have no less than five academic works published in a journal listed in an internationally recognized database.

External experts who do not meet the above academic qualification and academic work requirements must be a person of highly recognized knowledge, expertise and experiences, which are directly or closely related to the dissertation/independent study topic, who have the approval of the University Council. The Higher Education Commission must also be notified.

10. 4. 4 A dissertation committee, whose duty is to evaluate the progress of a dissertation, shall consist of:

1) a principal dissertation advisor;
2) a dissertation co-advisor(s) (if any);
3) a program faculty member(s);
4) an expert member(s) (if any).

The combined number of Clause 3) and Clause 4) committee members must not be less than the number of dissertation advisor(s).

1 0.4.5 Dissertation examiners shall have the duties of deliberating student's research competency, comprehensive knowledge on the research topic, written and oral presentation ability as well as their intellectual ability and resourcefulness in answering examiners' questions. The Committee shall consist of:

1) a principal dissertation advisor;
2) a dissertation co-advisor(s) who is a program faculty member (if any);
3) a program faculty member(s);
4) an expert member(s).

The combined number of Clause 3) and Clause 4) examiners must be higher than the dissertation advisor(s) and must not be less than five members. Chairperson of the

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dissertation examination committee must be an external expert and must not be the principal dissertation advisor or dissertation co-advisor. Dissertation examiners must be appointed by the Faculty Committee and must have the academic qualification, qualifications and academic works as follows:

Dissertation examiners who are a program faculty member must hold a doctoral degree or its equivalent or at least a master's degree or its equivalent and an academic rank of Associate Professor. They must also have at least three academic works, which are not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years. At least one of such works must be based on the results of a research work.

Dissertation examiners who are an external expert must hold a doctoral degree or its equivalent and have no less than five academic works, which are directly or closely related to the dissertation topic, published in a journal listed in an internationally recognized database.

External experts who do not meet the above academic qualification and academic work requirements, must be a person of highly recognized knowledge, expertise and experiences, which are directly or closely related to the dissertation topic, who have been approved by the University Council. The Higher Education Commission must also be notified.

10 . 4 .6 Course instructors must be a regular faculty member or a special instructor who holds a doctoral degree or its equivalent or at least a master's degree or its equivalent and an academic rank of Associate Professor in the specific or related discipline of the program or in the discipline of the course that they teach. They must also have previous teaching experience and at least one academic work, which is not a part of their study toward a degree, disseminated in accordance with the criteria for academic rank appointment in the past five years.

For courses that are not the courses in the program's field of study, course instructors who hold a master's degree or its equivalent and an academic rank lower than Associate Professor may be allowed to become the course instructor.

Special instructors must teach no more than 50 percent of total course time.

Clause 11 Workload of thesis/ dissertation and independent study advisors

11. 1 A program faculty member can be an independent study advisor for no more than 15 master's degree students.

For program faculty members who are both thesis and independent study advisor, the workload for supervising one thesis/dissertation student shall be equivalent to the workload for supervising three independent study students. However, the combined number of students under their supervision must not exceed 15 students per semester.

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11. 2 A program faculty member can be the principal thesis/dissertation advisor for master's degree and doctoral degree students in accordance with the following criteria:

Program faculty members who hold a doctoral degree or its equivalent and have the academic works specified by the Standard Criteria for Graduate Program, they can be a thesis/dissertation advisor for no more than 5 master's degree and doctoral degree students per semester.

Program faculty members who hold a doctoral degree or its equivalent and an academic rank of Assistant Professor or higher or hold a master's degree or its equivalent and an academic rank of Associate Professor or higher, who have the academic works specified by the Standard Criteria for Graduate Program, can be a thesis/dissertation advisor for no more than 10 master's and doctoral degree students per semester.

In the case where it is necessary for a program faculty member, who holds a doctoral degree or its equivalent and an academic rank of Professor, to supervise more than the prescribed number of students, the case must be submitted to the University Council for consideration. However, the number of supervised students submitted to the University Council for consideration must not exceed 15 students. If it is necessary for such program faculty member to supervise more than 15 students, the case must be submitted for the Higher Education Commission's consent on a case-by-case basis.

Section 4 Student Admission

Clause 12 Applicant qualifications

12.1 For master's degree and graduate diploma programs, applicants must hold a bachelor's degree or be in the final semester of a bachelor's degree program of a higher education institution,

whose programs are recognized by the Office of the Civil Service Commission (OCSC), and have additional qualifications as prescribed by the program.

12.2 2 For higher graduate diploma programs, applicants must hold a master's degree or be in the final semester of or expect to graduate from a master's degree program at a higher education institution, whose programs are recognized by the Office of the Civil Service Commission (OCSC), and have additional qualifications as prescribed by the program.

12.3 Doctoral degree programs

12.3.1 Applicants must hold a bachelor's degree from a higher education institution, whose programs are recognized by the Office of the Civil Service Commission (OCSC), with a cumulative GPA of no less than 3.25 or equivalent and are deemed by the program responsible faculty members to have suitable qualifications for admission to the program;

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12 . 3. 2 Applicants must hold a master's degree or its equivalent from a higher education institution, whose programs are recognized by the Office of the Civil Service Commission (OCSC), and are deemed by the program responsible faculty members to have suitable qualifications for admission to the program;

12.3.3 Have additional qualifications as prescribed by the program. The University may hold a pre-admission examination to screen applicants and to test whether they meet the University's required academic standards.

Clause 13 Student admission

131 1 The University shall consider applicant suitability by conducting a written examination, an interview or any other methods as approved by the program responsible faculty members and informed to the Faculty for acknowledgement.

132 2 In the case where applicants are awaiting the outcomes of their master's or bachelor's degree program, admission to a program shall be completed upon their submission of their graduation evidence to the University by the prescribed period as prescribed in the "Applicant qualifications" section.

13.3 Full-time students who are a civil servant, government official, government employee or state enterprise employee, admission to a program shall be valid when they have been granted a study leave by the organization of their affiliation.

13.4 4 Students can concurrently enroll in no more than two graduate programs and must inform the program responsible faculty members of both programs of such enrolment.

13.4.1 Both programs must be offered by the University as two separate programs.

13.4.2 2 Specific courses and core courses to be shared by both programs must be clearly specified in terms of the required number of courses and course credits.

13.4.3 Students must enroll in their study plans as prescribed by individual program.

13.4.4 4 Students must register for all the courses prescribed by both programs. For shared courses, students may register for such courses as a part of a specific program.

13.4.5 In the case where students concurrently enroll in both programs, their program responsible faculty members and academic advisors must determine whether students should produce one or two theses/independent study reports. If students will produce a single thesis/dissertation or independent study work, the work must cover or integrate the contents of both programs and the principal thesis/dissertation advisors must come from both programs.

13.5 If a doctoral degree student wishes to change from part-time to full-time study plans or vice versa, he/she must indicate an intention to make such change at least 30 days before the semester begins. They must have the consent of their academic advisor and the program responsible faculty members.

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Clause 14 Student status

14.1 Regular student means a student who has all the required qualifications and passed the University's selection process.

14.1.1 Full-time regular student means a student who enrolls in a graduate program at the University and attends classes during the University's official hours on a full-time basis.

14.1.2 Part-time regular student means a student who enrolls in a graduate program at the University and attends classes during some of the University's official hours or outside the official hours.

14.2 2 Provisional master's degree student is defined as a student who has been admitted to a program on the condition that he/she must earn a cumulative GPA of no less than 3.00 in the first semester to be eligible for a change to a regular student status. The program may set any other conditions.

14.3 Provisional master's degree student is defined as a student who is admitted to a program on the condition that he/she must take additional foundation courses as prescribed by the program or as the program responsible faculty members deem appropriate or as prescribed by the program.

14.4 4 External student means a person who does not have student status in the University's regular program but is authorized to enroll in some courses, course clusters or to attend a training offered by the University to enrich his/her knowledge.

Clause 15 Duration of study

15.1 Graduate diploma programs - a duration of no more than three academic years.

15.2 Higher graduate diploma programs – a duration of no more than three academic years.

15.3 Master's degree programs – a duration of no more than five academic years.

15.4 Doctoral degree programs – a duration of no more than eight academic years for students with a bachelor's degree, and no more than six academic years for students with a master's degree.

Section 5 Student registration and course registration

Clause 16 Student registration

Students who are admitted to a program under the University's announcement must report to the University for student registration, with all required evidences, at the date and time specified by the University. Otherwise, they shall be deemed to have relinquished their admission right.

Clause 17 Course registration

17.1 Course registration

17.1.1 Students must have the consent of their academic advisor for course registration.

17.1.2 Doctoral degree students can register for a dissertation course only after they passed the Qualifying Examination (QE).

17.1.3 . 3 Full-time regular students must register for a minimum of 6 credits and a maximum of 15 credits of graduate or thesis/dissertation courses per semester, except when they have less than 6 remaining credits toward program completion they shall be permitted to register for less than 6 credits. Students may not register for more than 6 credits in a special semester. In other

cases, students must have the consent of their academic advisor and the approval of the program responsible faculty members to register.

Part-time regular students must register for a minimum of 3 credits and a maximum of 15 credits of graduate or thesis/dissertation courses per semester, except when they have less than 6 remaining credits toward program completion they shall be permitted to register for less than 3 credits. Students may not register for more than 3 credits in a special semester. In other cases, students must have the consent of their academic advisor and the approval of the program responsible faculty members to register.

Type 1 doctoral degree program who have not yet passed their qualifying examination shall pay full tuition without having to register for a dissertation course.

17.1.4 Non-compliance with Clause 17.1.3 is permitted with the consent of student's academic advisor and the approval of program responsible faculty members.

17.1.5 Regular students who are re-admitted to a program can transfer their previous academic achievement under Clause 28.2.4.2 – Clause 28.2.4.2 or must register for graduate or thesis/dissertation courses with the consent of their thesis/dissertation advisor and the approval of the Faculty Committee. A new thesis/dissertation committee must be appointed, which can be the original committee, and students may not have to take another qualifying examination or thesis/dissertation proposal examination. However, if there is a change to the thesis/dissertation topic, the provision of Clause 18.2.4.3 shall apply.

17.1.6 Students who have not registered within the period specified by the University shall not be eligible to register for courses in that semester except in case of necessity and students have obtained the approval of the Faculty Committee to register for courses or to maintain their student status as a special case. The registration must be in accordance with the University's calendar.

17.1.7 Course registration period shall be in accordance with the University's announcement in each year.

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17.1.8 8 In case of necessity, students who cannot pay all or part of their tuition and fees may apply to the President for an extension approval through the Student Financial Aid Unit.

Students awaiting scholarship payment, both from within and outside the University, shall be granted tuition and fees extension until they are paid. However, the extension shall be

granted to just before the final examination period in each semester. Students must submit relevant documents and evidences of scholarship awarding for an extension consideration.

Students who have no scholarship award or who are awarded insufficient amount of scholarship to cover all tuition and fees must apply for an extension of payment and must pay their tuition and fees in full before the final examination period in each semester. In case of necessity where they cannot do so within that period, the students must apply to enter into an extension agreement with the University and must complete such payment before the final examination period in the last semester before graduation.

17.19 9 The Registrar's Office will check the list of students who have not paid their tuition and fees, except for those who have applied for an extension, and notify students to complete their tuition and fees payment before the mid-term examination period in each semester. If the students have not fully paid their tuition and fees by the specified date, the University will not allow them to take the mid-term examination for that semester. In such case, students must apply for a leave of absence or else their student status shall be terminated.

17.2 Inter-institutional registration

Inter-institutional registration must have the approval of the program responsible faculty members under the following criteria:

1721 1 The institution that a student wishes to register for a course must be an institution recognized by the Office of the Higher Education Commission (OHEC) or a government agency with the legal authority. It must not be a higher education institution with unlimited number of places for student admissions and must be approved by the Faculty.

1722 For compulsory course inter-institutional registration, the courses must contain no less than three-fourths of equivalent content or learning outcome to those of the courses required by the program. Criteria for inter-institutional registration of such courses are as follows:

17.2.2.1 Being a course required by the program but is not offered at the University in a particular semester and academic year for the reasons approved by the student's academic advisor and the program responsible faculty members.

17.2.2.2 . 2 The course being offered at another institution must contain no less than three-fourths of equivalent content or learning outcome to those of the courses required by the program and must have the consent of the student's academic advisor and the program responsible faculty members.

17. 2. 3 The language of instruction for such courses must be in accordance with the following criteria:

17231 . 1 Students of a Thai program can register for a course being offered by an English or international or bi-lingual program.

17232 . 2 Students of an English or international program must register for a course being offered by an English or international or bi-lingual program with a foreign language as the language of instruction only. In the case where it is necessary for students to register for a course in a Thai program, they can apply for a special permission to do so with the consent of their academic advisor and program responsible faculty members.

17233 . 3 Students of a bi-lingual program can register for a course being offered by an English or international or Thai program.

17. 2. 4 Course credits and grades earned from inter-institutional courses can be included as part of the academic achievement under the student's study program. A credit transfer equivalency of such courses must be approved by the Faculty Committee.

Clause 18 Late registration, course adding/dropping and withdrawal

18. 1 Late registration must be completed within five working days from the registration date specified by the University. Students must pay late registration fee at the rate prescribed by the University.

Upon expiration of the late registration period under paragraph One, if students have not yet registered, they shall not be eligible to register in that semester except in the case of necessity or force majeure event for which students can still register with the approval of the program responsible faculty members. They must pay late registration fee at the rate prescribed by the University,

For regular semesters, late registration must be completed within 30 days of the start date of each semester. Upon expiration of this period, the Dean or Director shall permit students to take a leave of absence for no more than 45 days. In such case, students must pay student status maintenance and late registration fees at the rates prescribed by the University.

182 2 Application for course adding and changing of study group must be completed within two weeks from the start date of a regular semester or within the first week of a special semester at the date and time specified by the University with the consent of their academic advisor and the approval of the course responsible faculty members.

18.3 3 Application for course dropping must be carried out before the mid-term examination period in a regular semester or within the first two weeks of a special semester with the approval of the students' academic advisor. Dropped courses shall not be recorded in the student's transcript.

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The University shall refund 80 percent of tuition fee if a course is dropped within two weeks from the start date of a regular semester or within the first week of a special semester. There shall be no refund for courses in programs with flat rate tuition and fees.

In case of course cancelling by the University, students shall receive full tuition refund.

18.4 Course withdrawal

18.4.1 Application for course withdrawal must be completed within three weeks prior to the final examination period in a regular semester or within the first two weeks but no later than the first four weeks of a special semester. Dropped courses shall be recorded as W in the student's transcript.

18.4.2 2 Application for course withdrawal can be carried out upon approval by the program responsible faculty members and consent by the student's academic advisor.

18.4.3 After course adding, dropping and withdrawal the remaining number of course credits must not be contrary to or inconsistent with Clause 17.1.3 of the present regulations.

Clause 19 Study duration

Students are eligible to take an examination in a theoretical course or practical course or course with experiments, practices, internship or field practices only when they have attendance time of no less than 80 per cent of total lecture or operation, experiment, practice, internship or field practice time.

Clause 20 Leave of absence

20.1 Students shall have permission to take a leave of absence from their study in one of the following cases:

20.1.1 1 being enlisted in military services, being mobilized for military training or to participate in a test of military preparedness;

20.1.2 in case of a force majeure event;

20.1.3 doctoral degree students who have completed six years of study, passed their dissertation examination, submitted a manuscript for publication and are awaiting publication of the final academic work to fulfill the requirements for graduation can take a leave of absence, which is not counted as a part of their duration of study, of no more than one academic year.

20.1.4 4 in case of necessity, students may be permitted to take a leave of absence as the case maybe.

20.2 Students can apply for a leave of absence of one semester each and can take a leave for no more than two consecutive regular semesters, except for a special case that must be permitted with the approval of the Faculty Committee.

20.3 3 When students are permitted to take a leave of absence the leave period shall be counted as part of their duration of study, except when they are permitted to take a leave of absence under Clauses 20.1.1 - 20.1.3.

20.4 A leave of absence must have the consent of the student's academic advisor and program responsible faculty members and the approval of the Faculty Committee.

20.5 Tuition and educational fees payment

20.5.1 Students who take a leave of absence prior to course registration do not have to pay tuition and fees but must pay the student status maintenance fee.

20.5.2 In the case where students paid their tuition and fees but subsequently need to take a leave of absence due to a force majeure event, they must apply for a leave of absence within two weeks from the start date of a semester and must have the approval of the Faculty Committee. Full refund shall be granted by the University but the students must pay student status maintenance fee.

Clause 21 Termination of Student Status

Students shall have their student status terminated in the following cases:

21.1 1 Graduation. Students have met all program requirements and have been approved for graduation;

21.2 2 Resignation. Students who wish to resign their student status shall apply through their academic advisor and program responsible faculty members for the approval the Dean of Director of an institution. While such approval has not been granted the students shall be deemed to still have their student status;

21.3 3 Failure to complete course registration or pay tuition and educational fees. Students who fail to make course registration or pay tuition and educational fee within six weeks from the start date of a semester, as specified in the University announcement, in any semester shall be deemed to have their student status terminated;

21.4 Death;

21.5 Expired duration of study

Students who cannot complete their study program within the period specified by each program under Clause 15 shall be deemed to have their student status terminated;

21.6 Have cumulative GPA lower than the passing criteria as follows:

21.6.1 For regular students,

In the first semester of study, students in a doctoral and higher graduate diploma program who earn a cumulative GPA less than 2.75 shall have their student status terminated. If their GPA is less than 3.25, they shall be put on academic probation.

In the first semester of study, students in a master's and graduate diploma program who earn a cumulative GPA less than 2.50 shall have their student status terminated. If their GPA is less than 3.00, they shall be put on academic probation.

21.6.2 Regular students in a doctoral degree and higher graduate diploma program who earn a cumulative GPA less than 3.25 in any semester shall be put on academic probation. While on probation, if their semester GPA is less than 3.25, their student status shall be terminated.

Regular students in a master's and a graduate diploma program who earn a cumulative GPA less than 3.00 shall be put on academic probation. While on probation, if their semester GPA is less than 3.00, their student status shall be terminated.

However, these provisions shall not apply to a thesis/dissertation-only program which focuses on thesis/dissertation work.

21.6.3 3 Provisional students under Clause 14.2 – Clause 14.3 who cannot change their student status to regular student or who cannot fulfill their admission conditions shall have their student status terminated.

21.7 Other cases

Students may have their student status terminated in other cases in accordance with the University regulation on such issue.

Clause 22 Reinstatement of student status

The President may approve a reinstatement of a student who had his/her student status terminated under Clause 21.3 when there is a reasonable cause and with the consent of the Faculty Committee.

In the case of paragraph One, after approval of student status reinstatement by the President, the students will be granted their original student number. The period between the termination of their student status to the reinstatement approval date will be considered as a leave of absence,

which will be counted as a part of their duration of study, unless otherwise approved by the University Council on a case-by-case basis. Nevertheless, the combined duration of study must not exceed the period specified in Clause 15.

The reinstatement of student status criteria and procedures shall be as prescribed by the University.

Section 6 Academic Assessment and Evaluation

Clause 23 An academic evaluation will be conducted at the end of each semester as follows**:**

23. 1 Academic assessment shall be based on a letter grading system and grade point average will be calculated by converting the letter grades into grade points whose meanings are as follows:

Grade	Point	Meaning
A	4.00	Excellent
B+	3.50	Very Good
B	3.00	Good
C+	2.50	Fairly Good
C	2.00	Fair
D+	1.50	Fairly Poor
D	1.00	Poor
F	0	Failure
Fe	0	Failure: Absent from examination
Fa	0	Failure: Insufficient attendance, examination denied
W	-	Withdrawal
S	-	Satisfactory
I	-	Incomplete
U	-	Unsatisfactory
Aud.	-	Audit

232 2 For courses that students must earn no less than C or S grade, if students earn less than these they must register for the courses again. For compulsory courses, they must register for the same courses but for elective courses, they may register for any other course.

233 F, Fe and Fa shall be awarded in the following cases:

23.3.1 1 Students fail to achieve the learning outcome prescribed by the program or

course (F)

23.3.2 Students committed a breach of examination regulations and were assigned

a failing grade (F).

23.3.3 3 Students were absent from an examination without the permission of the course instructor, program responsible faculty members and the Faculty Committee (Fe).

23.3.4 Students were not permitted to take an examination under Clause 19 (Fa).

23.4 S or U shall be awarded in the following cases:

Foundation courses or courses specified by the program or deemed suitable by the program responsible faculty members to have S or U assessment. Thesis/dissertation or Independent Study courses shall be awarded a letter grade of S when students produce satisfactory study or research outcomes and have no less than 80 percent of class attendance or practical works.

23.5 I shall be awarded in the following cases:

23.5.1 Students did not take an examination or failed to submit academic work due

to illness that can be backed up by a medical certificate. Students must have at least 80 percent of class attendance.

23.5.2 Students did not take an examination or failed to submit academic work due to a force majeure event. The awarding of I shall be at the discretion of the course instructor and program responsible faculty members.

23.5.3 3 The course instructor and program responsible faculty members deem that course evaluation should be delayed.

23.6 The following procedures must be taken to change the letter grade I:

23.6.1 1 Students sit for another examination or submit additional work within one month from the University's announcement date of the examination results. In this case, the letter grade I shall not be listed in the transcript.

23.6.2 Work on additional assignment and have it re-assessed by the next semester. Students must register in the course that they received the letter grade I but do not have to pay the registration fee for that course or else they shall be awarded an F or U grade. In this case, the letter grade I shall be listed in the transcript.

23.7 Aud. shall be awarded in the following cases:

23.7.1 U Students who register for audit course with no credit granted must have no less than 80 percent of class attendance or practical works. If they have less than 80 percent of class attendance or practical works they shall be awarded the letter grade of U.

23.7.2 Students who receive Audit (Aud.) for any course cannot have it changed to grade points at later date. Such courses cannot be used as a prerequisite for any continuing course.

23.8 W shall be awarded in the following cases:

23.8.1 Courses that students have been permitted to drop under Clause 18.4.

23.8.2 Students have been permitted to take a leave of absence from study.

23.8.3 Students received a suspension of study penalty.

Clause 24 Counting course credits

24. 1 Counting of accumulated registered credits earned by students to fulfill program requirements. Only the course credits for compulsory courses that students received the letter grades of S and B or higher and the course credits for elective courses that students received a letter grade of C or higher shall be counted. In the case where students registered in a course more than once, only the last course credits and the passing grade earned in the last registration shall be counted and included in the calculation of the students' cumulative GPA.

24.2 For students who re-register for a course, the course credits in the last course registration shall be used for a single calculation of students' GPA and cumulative GPA. The original grades earned shall be listed in the transcript for the semester of its registration.

Clause 25 Calculation of Grade Point Average (GPA) and approval of course evaluation

25.1 There are two types of GPA calculation: semester GPA and cumulative GPA.

25.1.1 Semester GPA is calculated from a student's academic achievement in a particular semester by multiplying the number of credits for each course by the grade points earned, then totaling multiplications for all courses and dividing it by total course credits taken in that semester for courses with grade point assessment. Use two decimal points by rounding up from the third decimal point.

25.1.2 Cumulative GPA is calculated from the academic achievement earned by a student from the start of his/her study at the University to the last assessment of his/her academic

achievement by multiplying the number of course credits for each course by the grade points earned, then totaling multiplications for all courses and dividing it by total course credits for all courses taken by the student with grade point assessment under Clause 23.1. Use two decimal points by rounding up from the third decimal point.

25.2 2 Program responsible faculty members and the Faculty Committee shall be responsible for academic assessment and evaluation consideration. In case of problems, the Faculty Committee shall have the authority to make a final decision. The Dean or Director will approve the student academic achievement for each semester.

Clause 26 Program transfer

26.1 Program transfer may be granted when there is a reasonable cause and the students requesting such transfer have studied in the original program for at least one semester.

26.2 Regular students may apply for a program transfer in the same faculty with the consent of the program responsible faculty members of both programs and the approval of the Faculty Committee.

26.3 Regular students may apply for a program transfer to a different faculty or institution with the consent of the program responsible faculty members of both programs and the approval of the Faculty Committee. The faculty responsible for the original program and the receiving faculty must be informed of the transfer.

26.4 Course transfer equivalency in the receiving program shall be in accordance with Clause 27.2.

Clause 27 Changing educational level

27.1 1 Change of educational level can be a change to a higher or lower level in the same field of study with the consent of the student's academic advisor and the program responsible faculty members as well as the approval of the Faculty Committee.

27.2 transfer equivalency in the program of the new educational level must be in accordance with Clause 28.2.

Clause 28 Course transfer equivalency

28.1 1 For students who used to take courses or course clusters in another domestic or overseas institution,

28.1.1 1 Being a course or course cluster in a graduate program or its equivalent that is recognized by the Office of Higher Education Commission or a government agency with the legal authority or foreign institution that has the permission of the Faculty Committee and the consent of the program responsible faculty members;

28.1.2 2 Being a course or course cluster with no less than three-fourths of core contents of the course requesting course transfer equivalency;

28.1.3 3 Being a course or course cluster for which students received no less than a letter grade of B or a grade point of 3.00 or its equivalent or a letter credit of S;

28.1.4 4 Students cannot have a credit transfer equivalency for thesis/dissertation or independent study courses and must re-register for these courses as required by the program.

28.1.5 Course transfer equivalency can be granted for no more than one-third of the total credits required by the receiving program.

28.1.6 The credits for a transfer course or course cluster shall not be included in the calculation of GPA but can be counted as pass credits toward graduation;

28.1.7 Students must have spent a minimum of one academic year at the University and must have registered for a minimum of 12 credits of coursework or thesis/dissertation or independent study as required by the receiving program;

28.1.8 Newly offered program may admit transferred students whose class level and semester are not higher than the ones attended by current students with the consent of the program responsible faculty members.

28.2 For students who used to take a course or course cluster at the University,

28. 2. 1 Students who had a program transfer under Clause 26 or a change of educational level under Clause 27 can apply for a course transfer equivalency and use transferred credits for GPA calculation.

28.2.2 . 2 Holders of a graduate diploma who were admitted to a master's degree program can request course equivalency provided that their academic achievement in such courses must not be lower than B. Transferred credits must be included in the calculation of their GPA.

28.2.3 Students who graduated with a bachelor's degree from the University and took graduate courses, which had not been used as a part of their bachelor's degree graduation requirements, can have a transfer equivalency for the courses that they earned no less than a letter grade of B or S or that they can demonstrate equivalent academic competency to the learning

outcome of that course in the master's degree program. However, the transferred credits shall not be included for the students' GPA calculation but can be counted toward program completion.

28.2.4 Students who had their student status terminated and have been re-admitted to the same or a new graduate program through normal selection process can transfer credits earned from previous courses with the consent of the program responsible faculty members and the approval of the Faculty Committee under the following criteria:

28.2.4.1 There is no limit on the number of credits that can be transferred through course transfer equivalency and students' academic achievement, numbers and titles of such course in the year of original enrollment must be recorded. Students must have earned a letter grade of B or a GPA of 3.00 or its equivalent or a letter grade of S for the course or have been found to have adequate learning outcome and academic potential to pass the courses requesting transfer equivalency. However, the transferred credits shall not be included in students' GPA calculation but can be counted toward program completion. Students must register for new compulsory courses required by the current program.

28.2.4.2 For credit transfer equivalency of thesis/dissertation or independent study courses, if there is no change to the thesis/dissertation topic, students can transfer passed thesis/dissertation credits to the current program without having to re-take a qualifying examination and thesis/dissertation proposal defense. Students can have credit transfer equivalency for no more than 90 percent of passed course credits with the approval of the Faculty Committee with the consent of the program responsible faculty members.

Students can also have their academic works, that were previously published or presented at an academic meeting, transferred with the consent of their academic advisor and program responsible faculty members and the approval of the Faculty Committee.

28.2.4.3 4 . 3 If there has been change to the thesis/dissertation topic, students cannot have the credits for previous thesis/dissertation course transferred. They must take a new proposal defense but can be exempted from taking another qualifying examination with the consent of the program responsible faculty members and the approval of the Faculty Committee.

28.2.5 Students cannot have credit transfer equivalency for the course that has been

used as a part of their graduation requirements but have to register for that course again as required by the program unless they have graduated under the provision of Clause 29.2.2.

28.3 For students who previously took courses at University as external students,

28.3.1 Academic achievement transfer shall be granted for all courses that students have studied in a program offered by the University with no limit on the number of courses or credits requesting a transfer.

28.3.2 .2 Being a course or course cluster that students have earned no less than a letter grade of B or a GPA of 3.00 or its equivalent or a letter grade of S. However, students must re-register in rapidly changing courses which shall be determined by the course responsible faculty members on a case-by-case basis.

28.3.3 The method of evaluation for a transfer of academic achievement in a course, course cluster or learning outcome earned from a training shall be as prescribed by the program responsible faculty members with the approval of the Faculty Committee.

28.3.4 Records of students' academic achievement shall comply with the method of evaluation. Transferred credits shall not be included in the GPA calculation but can be counted toward graduation.

28.4 4 For course transfer equivalency under Clauses 28. 1- 28. 3, if it is a course with rapid change or volatile transformation, students must re-register for that course as determined by the program responsible faculty members and the Faculty Committee on a case-by-case basis.

28.5 5 Students who wish to have course transfer equivalency must apply to the program responsible faculty members and submit the transcript and description of such course within one month of the start date of a semester as specified in the University announcement. Such application must have the consent of the program responsible faculty members and approval of the Faculty Committee.

Clause 29 Transfer equivalency of knowledge, skills and experiences and the assignment of credits for courses in the non-formal and informal education systems

29.1 1 Committee for the transfer equivalency of knowledge, skills and experiences and assignment of credits for courses in the non-formal and informal educational systems.

A Transfer Equivalency Committee appointed at a Faculty Committee meeting to deliberate the equivalency of knowledge, skills and experiences in a specific course or course cluster shall consist of at least three committee members who come from the course responsible faculty members and other committee members appointed by the responsible faculty.

The Transfer Equivalency Committee shall have the following powers and duties:

(1) To determine criteria for the equivalency of knowledge, skills and experience and the assignment of credits for courses in the non-formal and informal educational systems, for individual course

and course cluster, which are based on the different methods that are consistent with the learning outcome of the transferred course.

(2) To evaluate knowledge, skills and experiences and assign credits for courses in the non-formal and informal educational systems for individual course or course cluster;

(3)) To notify evaluation results to the students, the Registrar's Office, the program responsible faculty members, the Faculty Committee of the students' affiliation and related agencies.

29 . 2 Eligible students for a request of transfer equivalency of knowledge, skills and experiences must have the following qualifications:

2921 . 1 Applicants for a transfer equivalency of knowledge, skills and experiences must be a student at the University;

2922 . 2 A transfer equivalency of knowledge, skills and experiences shall be as specified in the University guideline and calendar in each academic year.

29 . 3 Criteria for a transfer equivalency of knowledge, skills and experiences, assessment and evaluation:

(1) Knowledge equivalency shall be carried out for individual course or course cluster offered for specific educational levels by the University's graduate programs;

(2) The methods pf evaluation used in the knowledge equivalency of individual course or course cluster as well as the decision criteria for each method of evaluation shall be as prescribed by the Transfer Equivalency Committee;

(3)) Students must pass the evaluation and the evaluation results must demonstrate that they have sufficient learning outcome and academic potential to pass the course that they request transfer equivalency and to pursue more advanced courses. The Committee shall assign credits for such course or course cluster as S/U, which shall not be used in the calculation of students' academic achievement or cumulative GPA;

(4)) Work experience equivalency shall be mainly based on the knowledge gained from such experiences to demonstrate sufficient learning outcome and students' academic potential to pass the course that they request equivalency and to pursue more advanced courses;

(5) Students' academic achievement shall be recorded as a letter grade of S, followed by "CKT" (Credits from Knowledge Transfer);

(6) For transfer equivalency of a course or course cluster in the non-formal or informal educational systems, their combined credits shall not exceed one-thirds of the total credits required by the receiving program. Students must have spent a minimum of two regular semesters at the

University and registered for a minimum of 12 credits of the coursework or thesis/dissertation required by the receiving program.

29.4 Procedures for the transfer equivalency of knowledge, skills and experiences.

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Students who wish to apply for a transfer equivalency of knowledge, skills and experiences can apply, with the consent of their academic advisor and program responsible faculty members, to the faculty or agency responsible for the course that they requesting knowledge, skill and experience transfer equivalency. The transfer equivalency procedures and evaluation method shall be as prescribed by the University. The Transfer Equivalency Committee shall send the results to the Faculty Committee responsible for approval.

29.5 Students can appeal the knowledge, skill and experience transfer equivalency results, through their academic advisor, to the Transfer Equivalency Committee within 15 days from the date that the results are known.

Section 7 Thesis/dissertation and independent study

Clause 30 Qualifying Examination

A qualifying examination is held to assess the knowledge and academic competency of doctoral degree students who must pass it, under the prescribed criteria, to be eligible for the registration, presentation and final oral defense of a dissertation.

(1) Doctoral degree students who hold a bachelor's degree must pass the qualifying examination within four regular semesters of their doctoral program commencement.

(2) Doctoral degree students who hold a master's degree must pass the qualifying examination within three regular semesters of their doctoral program commencement.

(3) Students who did not pass the qualifying examination or have not taken one within the prescribed period shall have their student status terminated.

Clause 31 Thesis/dissertation

31. 1 Students can register for a thesis/dissertation course upon approval by their academic advisor.

31.1.1 Plan A 2 master's degree students can register for a thesis course after having been a regular student for at least one semester and having registered for and passed no less than 6 credits of coursework. They must also have a cumulative GPA of no less than 3.00, except for

students whose student status had been terminated and have been re-admitted to the program under Clause 28.2.4, who can register for a thesis course in the semester of their readmission.

31. 1 . 2 Doctoral degree students must pass the qualifying examination before registering for a dissertation course. Type 2 doctoral degree students can register for a dissertation course after they have been a regular student for at least one semester, have registered for and passed no less than 6 credits of coursework. They must also have a cumulative GPA of no less than 3.25, except for students whose student status had been terminated and have been re-admitted to

the program under Clause 28.2.4 who can register for a dissertation course in the semester of their readmission.

31. 1. 3 Students can divide course credit for their thesis/dissertation course registration with the consent of their thesis/dissertation advisor, provided that it does not contradict the provision of Clause 17.1.3.

31.2 Thesis/dissertation proposal

31.2.1 After registering for a thesis/dissertation course, students must prepare a thesis/dissertation proposal for submission to their thesis/dissertation advisor for correction and submission to the program responsible faculty members for their consent.

31.2.2 2 Program responsible faculty members shall forward the thesis/dissertation proposal and a list of proposed thesis/dissertation committee members to the Faculty Committee for approval of the thesis/dissertation topic and appointment of the thesis/dissertation committee members.

31.3 Thesis/dissertation proposal examination and thesis/dissertation evaluation

31.3.1 1 Students must pass the thesis/dissertation proposal examination and submit a thesis/dissertation progress report to the thesis/dissertation committee every semester.

31. 3. 2 Thesis/Dissertation Committee shall evaluate the progress of a thesis/dissertation work based on the number of credits that students have registered for in each semester. A letter grade of S shall be awarded to research with satisfactory progress and U to students who failed to conduct the research as planned. Students who passed a thesis/dissertation examination and submitted the thesis/dissertation shall be awarded a letter grade of S for all thesis/dissertation credits.

31. 3. 3 Students who have registered for a thesis/dissertation course but failed to produce consistent work for two consecutive semesters shall be awarded a letter grade of U. The

Thesis/Dissertation Committee may recommend the students to discontinue their work on a specific thesis/dissertation topic with the consent of the program responsible faculty members and the approval of the Faculty Committee.

31.4 Change of thesis/dissertation topic and the number of thesis/dissertation course credits

31.4.1 In the case where the Thesis/Dissertation Committee deems it appropriate to have a student change his/her thesis/dissertation topic or previously approved number of course credits due to an academic impasse or a force majeure event, the student, with the consent of the program responsible faculty members, must apply for a change of thesis/dissertation topic and enclose a new thesis/dissertation proposal as specified in Clause 31.2 for the Dean's approval, to the Dean for approval.

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31.4.2 2 In case of minor adjustment to a thesis/dissertation title for compliance with the final research results with no significant change to the research objectives, as recommended by the Thesis/Dissertation Committee, students shall apply, through their academic advisor and program responsible faculty members, to the Dean for approval of the new thesis/dissertation title without having to enclose a new research proposal.

31.4.3 3 Students who have applied for a change of thesis/dissertation topic must re- register and pay the thesis/dissertation tuition again except in the case of minor adjustment under Clause 31.4.2.

Clause 32 Thesis/dissertation examination

32. 1 Students are entitled to apply for a thesis/dissertation examination with the approval of the Thesis/Dissertation Committee by submitting a name list of the thesis/dissertation examination committee members and the examination date to the program responsible faculty members for their consent and to the Faculty Committee for consideration, approval and appointment of the thesis/dissertation examination committee members.

32. 2 Students must submit a thesis/dissertation draft to each of the Thesis/Dissertation Examination Committee members at least two weeks before the thesis/dissertation examination date. If they cannot do so, the Thesis/Dissertation Examination Committee may defer the examination to a later date, no less than two weeks but no more than one month from the date that the Committee members receive the thesis/dissertation draft.

32.3 The Thesis/Dissertation Examination Committee shall be responsible for the thesis/ dissertation examination. A letter grade of S shall be awarded for satisfactory outcome. In case of

unsatisfactory outcome, students can take the examination again within the period prescribed by the Thesis/Dissertation Examination Committee.

32. 4 Students who have passed their thesis/dissertation examination shall revise it in compliance with the Thesis/Dissertation Examination Committee's recommendations. For minor but time-consuming revision, the Thesis/Dissertation Examination Committee may set a submission date to more than 30 days but no more than 60 days from the examination date. Failure to submit a thesis/dissertation by such date shall result in the awarding of a letter grade of U. After thesis/dissertation submission, the faculty shall examine the thesis/dissertation format in accordance with the University's thesis/dissertation writing and publication guidelines within 30 days of the submission. An electronic copy of the thesis/dissertation must be produced as specified by the University announcement.

32. 5 Master's degree theses should be written in English while doctoral dissertations must be written in English.

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32.6 Thesis/dissertation examinations shall be an open examination that can be attended by all interested persons, except for a thesis/dissertation topic that has been conducted in collaboration with an organization who wishes to keep it confidential. In such case, permission for a closed examination must be obtained from the Dean or Director on a case-by-case basis.

32.7 The rights to a thesis/dissertation shall belong to the University unless otherwise agreed with the thesis/dissertation research sponsor.

Clause 33 Independent Study

The Faculty Committee shall set guidelines for the conducting of independent study by Plan B master's degree students which are not conflicting with the present regulations.

33.1 The Comprehensive Examination Committee under Clause 34.3.3 (a) shall be as prescribed in Clause 10.3.6.

33.2 The Independent Study Examination Committee in Clause 34.3.3 (b) shall be as prescribed in Clause 10.3.5.

33.3 3 An independent study examination shall be an open examination that can be attended by all interested persons, except for an independent study topic that has been conducted in collaboration with an organization who wishes to keep it confidential. In such case, permission for a closed examination must be obtained from the Dean or Director on a case-by-case basis.

Section 8 Graduation

Clause 34 Students shall be awarded a diploma or degree from the University when they have all qualifications as follows:

34.1 Graduate diploma students must have obtained all course credits and passed all courses required by the program structure with a cumulative GPA of no less than 3.00.

34.2 Higher graduate diploma students must have obtained all course credits and passed all courses required by the program structure with a cumulative GPA of no less than 3.25.

34.3 Master's degree students

34.3.1 Plan A, Type A 1 students,

(a) must have presented a thesis and passed the final oral defense; and

(b) have at least one full paper, which is based on their thesis or a part of their thesis work, published or at least accepted for publication in an international journal or have other equivalent work which has been approved by the Faculty Committee.

34.3.2 Plan A, Type A 2 students,

(a) must have obtained all course credits and passed all course examinations as prescribed by the program structure with a GPA of no less than 3.00 on a 4-point scale or its equivalent; and

(b) must have presented a thesis, passed the final oral defense and have their thesis or part of their thesis published or at least accepted for publication in a national or international journal or presented at an academic conference. Such paper must be a full paper that has been published in the conference's refereeing proceedings.

34.3.3 Plan B students,

(a)) must have obtained all course credits and passed all course examinations as prescribed by the program structure with a GPA of no less than 3.00; and

(b)) must have presented an independent study work and passed an oral or written comprehensive examination; and

(ค) must have presented an independent study work and passed the final oral examination.

34. 3 . 4 must have passed an English language examination under the criteria prescribed by each program. If no criteria have been specified by the program, the University's criteria shall apply.

34.4 Doctoral degree students,

34.4.1 must pass the final oral dissertation defense;

34.4.2 2 must pass an English examination in accordance with the criteria prescribed by each program or as specified in the University announcement.

34.4.3 Type 1 plan students,

(a)) must have obtained all dissertation credits as required by the program structure;

(b) must have presented a dissertation that can demonstrate new academic discovery, initiative or original criticism;

(c) must have no less than two full papers, which are based on their dissertation or part of their dissertation, published in an international journal listed in a standard refereeing database.

34.4.4 Type 2 plan students

(a) must have obtained all course credits and passed all course examinations as required by the program structure;

(b) must have a cumulative GPA of no less than 3.25;

(c) must have presented a dissertation that can demonstrate new academic discovery, initiative or original criticism;

(d) must have disseminated academic work in one of the following forms:

(1) have no less than two full papers, which are based on their dissertation or a part of their dissertation work, published or at least accepted for publication in an international academic journal listed in a standard refereeing database; or

(2) have no less than one full paper, which is based on their dissertation or a part of their dissertation work, published or at least accepted for publication in an international academic journal listed in a standard refereeing database; and

(2.1) have no less than two full papers published in a regional or national refereeing journal; or

(2 . 2) have no less than two research papers presented at an international academic conference with their full papers published in the conference's refereeing proceedings; or

(2 . 3) have at least one full paper published in a regional or national refereeing journal and at least one research paper presented at an international conference with its full paper published in the conference's refereeing proceedings.

Clause 35 Students must fully comply with the requirements of each program with the consent of the program responsible faculty members and the Faculty Committee.

Clause 36 For degree awarding consideration, in addition to students' academic achievement, the Faculty Committee shall also take into consideration the behaviors, moral and ethical conducts that the students have displayed throughout the time of their study at the University to the submission date of their names for degree awarding to the University Council. This is to ensure that the students are worthy of the honors and privileges vested on them by the University.

Section 9 Appeal

Clause 37 Appeal

When the University has considered and issued a directive or judgement on any matter related to the present regulations, if a student disagrees with such directive or judgement, he/she is entitled to submit an appeal to the University within 30 days of the date that they have acknowledged the said directive or judgement, as the case may be.

Clause 38 When the original judgement is confirmed by the Appeal Committee appointed by the University, the Committee's decision shall be final. If the Committee decided that the original resolution should be altered, the matter shall be presented to the President for consideration and final decision. The President's directive or judgement shall be final.

A meeting to deliberate an appeal must be attended by no less than half of all committee members to constitute a quorum. A final decision shall be decided by a majority vote. In the case of an equality of votes, the chairperson of the meeting shall have the casting vote.

The Appeal Committee shall consist of:

1. A Vice-President or an authorized person as the committee chairperson;
2. Three representatives from the Academic Council as committee members;
3. A representative from the faculty of the student's affiliation as committee member

and secretary.

No more than two university officials shall be appointed as assistant secretaries. The Appeal Committee shall have the powers to consider student's appeal and must completed it deliberation within 90 days of the date that it received an appeal from the Faculty Committee.

Transitory Provision

Clause 39 The Thesis/Dissertation Committee or Thesis/Dissertation Examination Committee that have been appointed before the announcement of the present regulations shall remain the appointed Thesis/Dissertation Committee or Thesis/Dissertation Examination Committee until such students have graduated or have their student status terminated.

Clause 40 Any action that has taken place before the effective date of the present regulations and has not yet been concluded when the present regulations come into force shall continue to function in compliance with the Standard Criteria for Graduate Program, B.E. 2558 (2015) and the relevant standard criteria issued by the Ministry of Education until its completion.

Issued on 7 February 2019.

(Dr. Thongchat Hongladarom) Chairman of the University
Council of
King Mongkut's University of Technology Thonburi

Appendix F MOUs with Foreign Organizations

MEMORANDUM OF UNDERSTANDING
JOINTLY SUPERVISED PhD DEGREE
(Cotutelle)

BETWEEN
MACQUARIE UNIVERSITY
AND
KING MONGKUT'S UNIVERSITY OF TECHNOLOGY THONBURI

1. In keeping with Clause 2 of the Memorandum of Understanding on Research Cooperation, executed 19/09/2013, and with reference to the valued relationship held by the two institutions, it is the wish of **Macquarie University** and **King Mongkut's University of Technology Thonburi (KMUTT)** (hereinafter referred to collectively as the "**Parties**", and individually as a "**Party**") to jointly reach a framework for collaboration by virtue of which each will develop and promote academic activities that will offer doctoral research students opportunities for international education.

2. Each Party's specific intention in entering this Memorandum of Understanding is to demonstrate to the other Party its respective interest in pursuing a proposed jointly supervised Doctor of Philosophy ("**Cotutelle**") program. Each successful candidate shall be awarded a separate degree by each university including a Doctor of Philosophy by Macquarie University ("**the Proposed Collaboration**").

3. The Proposed Collaboration shall provide:
   - an opportunity to facilitate international research for doctoral candidates, including access to the latest research equipment in two countries/institutions;
   - a mechanism to enhance co-operation and collaboration between the researchers and the universities involved;
   - an opportunity to recruit international students of the highest calibre to research training programs.

4. The purpose of this Memorandum of Understanding is only to express the intentions of the Parties. The provisions contained in this Memorandum of Understanding are not legally binding

5. Where either or both of the Parties propose any specific arrangement concerning students from either or both of their institutions relating to the implementation of the Proposed Collaboration ("**Proposal**"), each Party agrees to nominate an appropriate representative and the Proposal shall be negotiated between the representatives of the Parties. Once the Parties have reached an agreement in relation to the Proposal, the agreement shall be recorded and governed by a separate legally binding agreement executed by both Parties ("**a Legal Agreement**").

6. A Legal Agreement should, without limitation, include provisions requiring:
(a) compliance by each Party (to the extent applicable) with the laws of country of each Party; and
(b) each Party's commitment to use reasonable endeavours to assist students governed by the arrangements under the Legal Agreement, to complete their studies, even if the Legal Agreement is terminated.

7. The universities acknowledge that all salary, travel, living and allied costs and expense will be determined at the discretion and be the responsibility of the visitor's home university.

8. All visits of staff and students shall be subject to compliance with entry and visa requirements of the two countries involved, and the requirements of the two universities.

9. **Macquarie University** asks **KMUTT** to note particularly the *Privacy and Personal Information Protection Act 1998* (NSW) and the *Education Services for Overseas Students Act 2000* (Cth) and the requirements placed on Macquarie University under those Acts.

10. Each Party recognises that the other Party has, may have, or shall have arrangements of a similar or different nature with other persons, whether in each Party's respective countries or elsewhere in the world, during the currency of this Memorandum of Understanding.

11. This Memorandum of Understanding becomes effective from the date of the last signature of the Parties and shall remain current for five (5) years with the understanding that it may be terminated by either party giving six months' prior written notice to the other Party.

12. Each party acknowledges that, unless otherwise agreed in writing by the Parties, the termination of this Memorandum of Understanding shall not have any effect whatsoever on any Legal Agreement in force at the time of termination of this Memorandum of Understanding.

In witness whereof, **Macquarie University** and **KMUTT** hereto have caused this Memorandum of Understanding to be executed by their duly authorized representatives.

Signed on behalf of
Macquarie University

X _____ 9·10·2018

Professor Sakkie Pretorius Date
Deputy Vice-Chancellor (Research)

Signed on behalf of
King Monkut's University of Technology Thonburi

_____ 9 Oct 2018

Assistant Professor Prasert Kanthamanon Date
Senior Vice President for Administrative Affairs

Witness (**Macquarie University**)

X _____

(Name) DR YI REN
(Title) EXECUTIVE DIRECTOR

Witness **King Monkut's University of Technology Thonburi (KMUTT)**

_____

(Name) Assoc. Prof. Dr. Pornapit Darasawang
(Title) VP for Internationalisation

COOPERATION AGREEMENT ON STUDENT EXCHANGE

between

King Mongkut's University of Technology Thonburi
Bangkok, Thailand

and

Shibaura Institute of Technology
Tokyo, Japan

In furtherance of their mutual interests in the fields of education and research, King Mongkut's University of Technology Thonburi (hereafter KMUTT) and Shibaura Institute of Technology (hereafter SIT) hereby agree upon the following areas of cooperation:

Aim

The aim of the present Agreement is to define the framework for common measures to be taken by KMUTT and SIT in order to promote the exchange of students in undergraduate and Master's course.

Credits and Marks

Participating students under this Agreement will be enrolled as exchange students at the Host University. Credits will be transferred to the Home University with a transcript of results provided to the Home University as soon as possible after the completion of studies of the respective student.

Principles

The exchange of students under this Agreement will be conducted in accordance with the following principles:

- Both universities agree to waive tuition charges for incoming students;
- Selection of exchange students will be made by mutual agreement and by following the appropriate steps as required by each of the universities.
- The final admission of students is always at the discretion of the Host University;
- The students will be responsible for covering the travel costs to the host country and living costs during the stay, including accommodation, books, equipment, consumables, accident insurance, health insurance and other expenses;
- The Host University will render assistance to the incoming students in finding appropriate accommodation;

- Students participating under the terms of this exchange will be entitled to participate in any introductory program that may customarily be arranged for foreign students;
- Exchanges including training periods must be agreed upon in advance on a case-by-case basis.

Mobility
The mobility shall be negotiated and determined on a yearly basis and balanced in relation to the total number of students in each direction as in Appendix. The reference date of students' mobility shall be August 1st.

Students' Right
Students participating under this Agreement shall be subject to the rules and regulations of the Host University. They will also enjoy the same rights and privileges as other students enrolled at the Host University.

Contact Person
Each university will nominate its own contact person, responsible for all measures to be undertaken under this Agreement. The contact persons will provide advisory and other academic services to students participating under this Agreement. Contact persons for this Agreement are listed in Appendix A.

Validity
This Agreement shall come into effect on the day of approval by both universities with duration of five years. It shall be renewed automatically, unless either university inform of the termination of this Agreement with written notice at least six months prior to the date of expiration. Commitments already in progress shall be fulfilled.

Amendments
Amendments or changes to this Agreement shall be made in writing and signed by the duly authorized representatives of the universities.

The Agreement has been signed in duplicate, of which each university will receive one copy.

Signed:

President
Dr. Sakarindr Bhumiratana
King Mongkut's University of Technology
Thonburi

Date: June 12, 2014

Signed:

President
Dr. Masato Murakami
Professor, College of Engineering
Shibaura Institute of Technology

Date: June 19, 2014