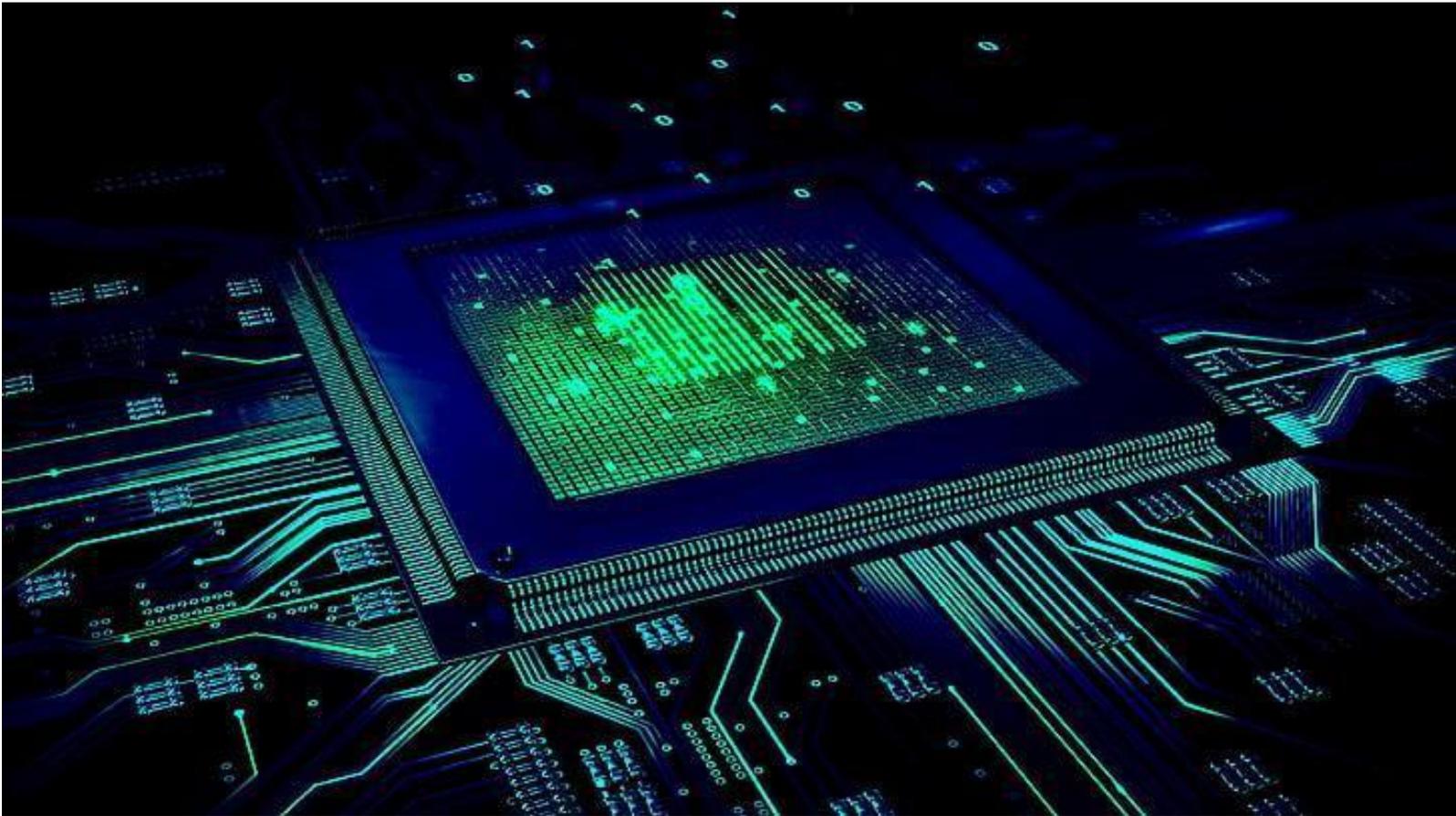


STUDENT HANDBOOK



Master of Science in  
**Artificial Intelligence and  
Computer Engineering**  
M.S. in AiCE

This document is for the internal use of CMKL University only and may not be distributed or reproduced for external distribution in any form without express written permission of the AiCE Program Director. This handbook will be posted to CMKL web page prior to the start of each academic year and updated as needed. This current version is effective as of August 1, 2022.

CMKL University  
1 Soi Chalongkrung 1  
Ladkrabang, Bangkok 10520  
Thailand  
+66 65 878 5000  
[www.cmkl.ac.th](http://www.cmkl.ac.th)

## Contents

<b>WELCOME TO ARTIFICIAL INTELLIGENCE AND COMPUTER ENGINEERING</b>	<b>5</b>
<b>BRIEF OVERVIEW OF PROGRAM</b>	<b>6</b>
Vision	6
Mission	6
Program Educational Objectives	6
Degrees Offered	7
Graduate Student Handbook	7
<b>CMKL UNIVERSITY STATEMENT OF EQUAL ACCESS</b>	<b>7</b>
<b>CMKL FACULTY</b>	<b>7</b>
University Officers	7
Course Instructors	8
<b>PRE-MATRICULATION</b>	<b>9</b>
Admissions Policies	9
English Language Proficiency Test	9
Final Transcripts	9
<b>ENROLLMENT AND REGISTRATION</b>	<b>10</b>
Overview	10
Degree Progress and Planning	10
Student Responsibility	10
Competency-based option	10
Degree Requirements Timeframe	10
Full-time Requirements	11
Double Counting Courses	11
Maximum Units Allowed	11
Retaking Courses	11
Auditing Courses	11
Pass/No Pass Courses	12
<b>REGISTERING FOR COURSES</b>	<b>12</b>
Course Load	12
Adding Courses	13
Course Locations	13
Dropping Courses	13
Withdrawing from Courses	13
Courses with Time Conflicts	13

Prerequisites	13
Final Exams	14
<b>RESEARCH ASSISTANT &amp; TEACHING ASSISTANT POSITIONS</b>	<b>14</b>
Research Assistant for Credit	14
Research Assistant for Pay	14
Teaching Assistant Positions	14
<b>ENROLLMENT AND DEGREE CERTIFICATION</b>	<b>14</b>
Enrollment Verifications	14
Leave of Absence	14
Returning from a Leave of Absence	15
Degree Certification Process & Commencement	15
<b>ACADEMIC STANDARDS</b>	<b>15</b>
Grades	15
University Policy on Grades	15
Grading Policy	16
Incomplete Grade	16
Withdrawal Grade	16
Academic Performance	16
Quality Points Average	16
Academic Probation	16
Academic Integrity	16
Penalties for Violating Academic Integrity	17
<b>M.S. AiCE DEGREE REQUIREMENTS</b>	<b>17</b>
Overview	17
Professional Track	17
Thesis Track	18
<b>INTEGRATED B.ENG./M.S. in AiCE</b>	<b>19</b>
Degree requirements	20
Residency requirements and financial impacts	20
<b>EXCHANGE AND TRANSFER PROGRAMS</b>	<b>20</b>
Internship Course Option	20
University Credit Transfer and Student Exchange Programs	20
AI Engineering Institute University Network	21
<b>POST-MATRICULATION GUIDELINES</b>	<b>21</b>
Return of University Property	21
Career Services Employment Outcomes	21
“Grandfather” Clause	21

<b><i>TUITION AND FEES</i></b>	<b><i>21</i></b>
<b><i>CONCLUSION</i></b>	<b><i>22</i></b>
<b><i>APPENDIX A: LIST OF PROGRAM COURSES</i></b>	<b><i>23</i></b>

## WELCOME TO ARTIFICIAL INTELLIGENCE AND COMPUTER ENGINEERING

Welcome to the Artificial Intelligence and Computer Engineering Program (AiCE) at CMKL University.

CMKL University was established in 2017 by a collaboration between Carnegie Mellon University and King Mongkut's Institute of Technology Ladkrabang (KMUTL).

Our graduate education and research programs provide students the opportunity to experience and participate in real world engineering research and projects, collaborating with partners of CMKL and of Carnegie Mellon University in the US. Carnegie Mellon has led the world in AI education and innovation since of the earliest work in AI, more than half a century ago. Its interdisciplinary research and rigorous education programs have become the touchstone for an international computing education. CMU provides a standard that our AiCE program aims to achieve.

The M.S. in AiCE program at CMKL equips students with the expertise to pursue new frontiers in AI, Computer Engineering, and Innovation. Our competency-based course design provides a well-rounded foundation of knowledge that can be put to immediate use to help people and organizations solve their real-world problems. Moreover, through artificial intelligence, computer engineering and an entrepreneurial perspective, AiCE graduates can assist our society in tackling challenges that will propel the future development of Thailand and Southeast Asia.

CMKL hosts the AI Engineering Institute (AIEI) which is a collaboration among leading Thai universities to advance AI Engineering education and research. In addition, our university serves as a hub of national AI supercomputing research infrastructure. Our students will be equipped with cutting-edge engineering research and education while accessing the best facilities and AI supercomputing. Students will be guided through the best practices used for building effective AI-systems, led by our faculty who are world-class academics and experts in the field.

In this handbook, you will find more information about the AiCE M.S. program. If you have questions or concerns not covered in this handbook, please do not hesitate to reach out to us. I am looking forward to seeing our graduates making positive impact in the field, enabling future possibilities for our economy and society.

Sincerely,



Akkarit Sangpetch, PhD  
AiCE Program Director  
CMKL University

## BRIEF OVERVIEW OF PROGRAM

Our mission is to foster the development of talented engineers and researchers who are ready for the next wave of digital disruption. Throughout the program, our students will explore how to apply AI techniques to major aspects of computing, including human-centric design and visualization, scalable and distributed computing systems, privacy and security. Students will learn through hands-on experience, working alongside our engineers and designers to solve the real-world problems of our industrial partners. Technical deep dive is also provided by working with our international teams of researchers and faculty members from leading universities.

### Vision

To be a creative driving force in engineering and innovation of highest quality in the university and worldwide.

### Mission

To inspire, educate, and foster the development of artificial intelligence and computer engineers capable of tackling fundamental engineering problems and important societal challenges, and to do so with the highest commitment to quality, integrity, and respect for others.

We aim to develop students' breadth of knowledge across the subject areas of AI and computer engineering, including their ability to apply engineering theory, abstraction, design, and implementation to solve problems and innovate through an interdisciplinary approach.

### Program Educational Objectives

Our program educational objectives are as follows. The objectives represent our vision for what our graduates will be doing in their careers five years after graduation.

- **Engineering Experts:** Our graduates will be able to solve problems by applying engineering fundamentals. Their solutions will reflect the depth and understanding of technology, drawing upon multiple disciplines and considerations for the problem.
- **Entrepreneurial Innovators:** Our graduates will demonstrate creativity in their engineering practice. They will be able to consider a system-oriented approach in their design. They will be able to strategically plan and execute successful engineering projects in their own businesses or organizations.
- **Ethical Leaders:** Our graduates will take initiative, demonstrating their resourcefulness and ability to collaborate in diverse and multidisciplinary teams. They will also be leaders in their organizations or professions while being aware of potential economic and societal impacts of their actions.

## **INTRODUCTION**

### **Degrees Offered**

Graduates of the M.S.in AiCE program will earn a degree from CMKL University. Students will be supervised by faculty advisors from CMKL University who will help them to create and define research projects to complete in pursuit of their degree. The advisors will also assist with selection of learning activities and other elements of the M.S.in AiCE program based on the student's background and academic goals.

### **Graduate Student Handbook**

This handbook is intended to set guidelines and expectations for new and current Master's students in Artificial Intelligence and Computer Engineering at CMKL University. This handbook is not exhaustive and will be subject to revision from time to time.

It is the responsibility of each student to read and understand the contents of this handbook. This handbook, along with any revisions, will be posted and announced annually on the university website.

## **CMKL UNIVERSITY STATEMENT OF EQUAL ACCESS**

CMKL University does not discriminate in admission, employment, or administration of its programs or activities on the basis of race, color, national origin, sex, handicap or disability, age, sexual orientation, gender identity, religion, creed, ancestry, belief, veteran status, or genetic information. Additionally, CMKL University adheres to non-discrimination policies set forth in Thai national laws and executive orders.

Inquiries concerning the application of and compliance with this statement should be directed to the Vice President for Campus Affairs, CMKL University, 1 Soi Chalongkrung 1, Ladkrabang, Bangkok 10520, Thailand. Obtain general information about CMKL University by calling +66 65 878 5000.

## **CMKL FACULTY**

Throughout their time in the AiCE program, students will encounter a variety of faculty and staff members who will help them on their way to completing their degree. For more details about faculty backgrounds and specialties, please visit the university website.

### **University Officers**

- President of CMKL University: Dr. Supan Tungjitkusolmun
- Vice President of CMKL University: Dr. Orathai Sangpetch
- AiCE Program Director: Dr. Akkarit Sangpetch

## Course Instructors

Paulo Garcia  
Assistant Professor, CMKL University  
Ph.D., Department of Electronics & Computer Engineering, University of Minho, Portugal

Sally E. Goldin  
Assistant Professor, CMKL University  
Ph.D., Cognitive Psychology, Carnegie Mellon University

Hossein Miri  
Assistant Professor, CMKL University  
Ph.D., Computer Science (Cognitive Robotics & Artificial Intelligence), University of Hull, UK

Akkarit Sangpetch  
Assistant Professor, CMKL University  
School of Engineering, King Mongkut's Institute of Technology Ladkrabang  
Adjunct Faculty, Department of Electrical and Computer Engineering, Carnegie Mellon University  
Ph.D., Electrical and Computer Engineering, Carnegie Mellon University

Orathai Sangpetch  
Assistant Professor, King Mongkut's Institute of Technology Ladkrabang  
Assistant Professor, CMKL University  
Adjunct Faculty, Department of Electrical and Computer Engineering, Carnegie Mellon University  
Ph.D., Electrical and Computer Engineering, Carnegie Mellon University

Supan Tungjitkusolmun  
Associate Professor, King Mongkut's Institute of Technology Ladkrabang  
Associate Professor, CMKL University  
Ph.D., Electrical Engineering, University of Wisconsin

Ekapol Chuangsuwanich  
Faculty of Engineering, Chulalongkorn University  
Adjunct Faculty, CMKL University  
Ph.D., Electrical Engineering and Computer Science, Massachusetts Institute of Technology

Chaya Hiruncharoenvate  
Senior Officer, Securities and Exchange Commission, Thailand  
Adjunct Faculty, CMKL University  
Ph.D., Computer Science, Georgia Institute of Technology

Suporn Pongnumkul  
Senior Researcher, National Electronics and Computer Technology Center  
Adjunct Faculty, CMKL University  
Ph.D., Computer Science and Engineering, University of Washington

Pongsin Poosankam  
Data Innovation, Krungthai Bank  
Adjunct Faculty, CMKL University  
Ph.D., Computer Science, Carnegie Mellon University

Sorakrit Phruthanontachai  
Vice President, Technology Division, Bangkok Bank  
Adjunct Faculty, CMKL University  
MSc E-Commerce Technology, University of Sussex, UK  
MBA MIT Sloan School of Management, US  
MS in E-Business Technology, the School of Computer Science, Carnegie Mellon University, US.

## **PRE-MATRICULATION**

### **Admissions Policies**

Admission criteria for the M.S. in AiCE Program are designed to reflect our core values and program outcome. We consider collaboration, perseverance, passion, advocacy for others and self-direction when making admission decisions. We are interested in students who can be successful at CMKL while fully engaging in the university community and our extended ecosystem.

For information about AiCE's admission policies, including application requirements, application deadlines, links to the application forms, please visit the university webpage:  
<https://www.cmkl.ac.th/academic/graduate>

### **English Language Proficiency Test**

All learning activities in the AiCE program are conducted in English. Therefore, all prospective students must demonstrate English proficiency. Specifically, all applicants whose native language is not English must take an English Language proficiency test. Native language is defined as first language, or language spoken from birth. The test scores must be submitted by the application deadline for the semester in which students are applying.

CMKL accepts TOEFL, IELTS or Duolingo English Test as evidence of English language proficiency. Please refer to the admissions website for minimum requirement for each test.

### **Final Transcripts**

As a condition of enrollment at CMKL university, applicants admitted to the AiCE program must submit final official transcripts, properly sealed, upon completion of their undergraduate program from the institution conferring their degree as a condition of enrollment at CMKL University. Certificates of graduation and/or degree certificates or equivalent should also be submitted if provided by the institution. Failure to provide such documents that confirm the completion of graduation requirements by the end of the first semester of study at CMKL University may prevent the M.S. in AiCE degree from being certified.

## ENROLLMENT AND REGISTRATION

### Overview

After matriculating into M.S. in AiCE, students should create an academic plan and register for courses. Students should actively engage in their process by reviewing degree requirements on the website, connecting with their academic advisor, and conferring with a faculty mentor. Once a schedule is developed, it is the student's responsibility to register for courses. Students must be registered for every course that they plan to take for the semester, even if it is not taken for credit (e.g., audited courses). After the first semester, a student's assigned registration time is determined by the number of completed units and cannot be changed.

### Degree Progress and Planning

#### Student Responsibility

It is the sole responsibility of the student to manage the academic progression of their program. Students are expected to ensure that they are taking the necessary prerequisites and courses to complete degree requirements on time. Students have the ability to add courses, drop courses, and select units for variable unit courses. It is the students' responsibility to be aware of all academic deadlines, including the add deadline, the drop deadline. Academic deadline information can be found on the academic calendar for each semester, which can be found at <https://www.cmkl.ac.th/hub>

If a student is not progressing as expected, they are expected to seek advice and counsel from their academic advisor. If the student is concerned that they may be unable to complete degree requirements, they should contact their academic advisor for assistance.

### Degree Requirements Timeframe

AiCE adheres to the official CMKL University Calendar, which can be found at <https://www.cmkl.ac.th/hub>.

The duration of the M.S. in AiCE program is three full-time semesters (1.5 year program). Students are required to enroll in at least 36 units per semester in order to maintain their full-time status as a student at CMKL. The maximum number of units allowed in a semester is 48 units.

Students are responsible for completing their enrollment each semester. Students who are not enrolled by the tenth day of class will be withdrawn from the university.

Students are encouraged to be physically present at the start of the semester, so they can engage in learning activities and meet their peers and their advisor. Not attending class from the start of the semester will have a detrimental effect on a student's progress in the program. AiCE will make an effort to verify all students have arrived to begin their program and will consider a student as "withdrawn from the university" if he or she is not here by the tenth day of class as defined by the academic calendar. If extenuating circumstances exist

that prevent a student from attending learning activities or meeting with the advisor, a student should notify the academic advisor and instructors immediately.

International students will need a Non-immigrant (ED) (“educational”) visa during the academic year, which can be extended. International students also need a valid re-entry permit if they wish to leave Thailand temporarily then return. Leaving the country without a re-entry permit will result in the cancellation of their educational visa. CMKL staff will assist international students in dealing with the Thai immigration department.

### **Full-time Requirements**

The M.S. degree program is a full-time program in which students complete four full-time (36 units) semesters. In addition to academic courses, the student must also enroll in M.S. graduate projects or research course and participate in ongoing university-partner project during their time in Thailand.

### **Double Counting Courses**

Students are required to notify the Graduate Affairs Office prior to declaring a degree outside of AiCE as this may have repercussions for your units and coursework to date. If a student takes the same course twice, the course with the higher grade will be counted towards the AiCE M.S. course requirements.

### **Maximum Units Allowed**

No more than 96 units should be taken while pursuing your degree at CMKL. These units include courses taken for audit, pass/no pass, and withdrawal. If it becomes clear that a student will exceed the maximum units and not be able to maintain the required 3.0 average, the student may be dropped from the M.S. in AiCE.

### **Retaking Courses**

If students do not pass a course, they should take a different course that will fulfill the requirement. Retaking a course is not recommended. Students may retake a prerequisite course in which they did not receive the minimum grade required. All grades are recorded on the transcript and factored into the cumulative QPA; however, only the best 96 units that fulfill degree requirements are factored into the required 3.0 graduation QPA.

### **Auditing Courses**

Auditing a course is being present in a classroom without receiving academic credit or a letter grade. An audited course will appear on a student’s transcript. Students who are present in a classroom and who are not receiving academic credit, or a letter grade must audit the class to continue to attend regularly. Students who want to audit a course are required to:

1. Register for the course.
2. Obtain permission and ask the instructor to sign the course audit approval form.
3. Submit the form to their academic advisor for approval.
4. If approved, the academic advisor will send the form for processing.

Once a course audit approval form is submitted, a letter grade (‘A’-‘R’) will not be assigned for the course and the declaration cannot be reversed. You can find the deadline for submitting this form on the Academic Calendar. After the deadline, students will not be able to request the option to audit a course.

The extent of the student's participation must be arranged and approved by the course instructor. Typically, auditors are expected to attend class as though they are regular class members. Those who do not attend the class regularly or prepare themselves for class will receive a blank grade. Otherwise, the student receives the grade 'O', indicating an audit.

The units of audited courses count toward the maximum course load units, but do not count toward the degree requirements. Any student may audit a course. For billing, an audited course is considered the same as the traditional courses under the tuition charges.

## **Pass/No Pass Courses**

Auditing a course is being present in a classroom without receiving academic credit or a letter grade. Students who want to take a course pass/fail are required to register for the course and submit the pass/no pass approval form to their academic advisor for approval. If approved, the academic advisor will send the form for processing.

Once a Pass/Fail Audit Approval form is submitted, a letter grade ('A'-'R') will not be assigned for the course and the declaration cannot be reversed. Passing work (letter grade 'A'-'C') is recorded as 'P' (passing grade) or 'S' (satisfactory) on the student's academic record, with both grades meaning the same; work with a grade at or lower than 'C-' will not receive credit and will be recorded as 'N' (not passing grade) on the student's academic record. No quality points will be assigned to 'P'/'S' or 'N' grades; the units of 'P'/'S' or 'N' grades will not be factored into the student's QPA.

The units of pass/no pass courses count toward the maximum course load units, but do not count toward the degree requirements. You can find the deadline for submitting this form on the Academic Calendar. After the deadline, students will not be able to request the option to pass/fail a course.

Any student may take a course pass/fail. For billing, the pass/fail course is considered the same as the traditional courses under the tuition charges.

## **REGISTERING FOR COURSES**

### **Course Load**

Due to the rigor of these programs, students are advised to take 36 units of courses in their first semester and 36 units of courses each semester thereafter. However, we recognize that our student body is diverse, and that includes how each student handles their course load. While students may register for maximum units each semester, we strongly recommend students take no more than 36 units each semester. Students unsure of whether they should take 48 units should schedule an appointment with their academic advisor to discuss their reason for overloading and prepare a plan for how to handle the additional load.

### **Adding Courses**

Students have the option of adding courses to their schedule starting at their assigned registration time until the add/drop deadline. If students wish to be added to a course after the add/drop

deadline, the Course Add Request Form must be completed and signed by the course instructor. Then, the students must submit the form to their academic advisor for approval.

### **Course Locations**

Courses will take place at various buildings and room locations across CMKL University as assigned in each academic semester. Please refer to the schedule of classes available for details.

### **Dropping Courses**

Students have the option of dropping courses from their schedule starting at their assigned registration time until the add/drop deadline. When a course is dropped before the drop deadline, it does not appear on the transcript. As a courtesy to others, students should drop a course as soon as they decide not to take it. This will allow a wait-listed student to be enrolled and will limit the disruption to any team-based projects.

### **Withdrawing from Courses**

Students should remove themselves from a course before the drop deadline each semester. If students choose to withdraw from a course after the drop deadline, the student must officially withdraw from the course and should consult with their advisor to discuss the withdrawal. Withdrawals take place after the drop deadline but before the last day of the semester, students must complete and submit the Course Withdrawal Request form with their academic advisor in order to withdraw from a course. Withdrawals receive a “W” grade for the course on a transcript; this “W” grade is not factored into the QPA but the course does count towards the maximum units.

### **Courses with Time Conflicts**

In general, students are not permitted to register for two courses that conflict in time. Registration may be possible with consent from an instructor, allowing the conflict or attendance at an alternate time. Students should forward permissions from instructors to their academic advisor in order to register for conflicting courses.

### **Prerequisites**

While the university may allow you to register for courses without having completed a published prerequisite course, it is the student’s responsibility to have adequate background knowledge to be successful in the subsequent course. This background knowledge may come in the form of an introductory course taken at CMKL, your undergraduate institution, or other work/research experience. You should consult with the instructors because it is up to their discretion whether or not a prerequisite course can be waived.

### **Final Exams**

All AiCE students must attend any final exams or other final evaluation activities as scheduled by individual course instructors. If students believe that a final exam presents a scheduling conflict, they must discuss the issue with the course instructor. Ultimately, attending the final evaluation activity is the student’s responsibility. Please keep this in mind when arranging travel at the end of a semester; having purchased airline tickets is not an acceptable excuse for missing a final exam.

## **RESEARCH ASSISTANT & TEACHING ASSISTANT POSITIONS**

### **Research Assistant for Credit**

See the section titled “Research Assistant for Credit” for more information about receiving academic credit for research.

### **Research Assistant for Pay**

Students are permitted to pursue research opportunities for pay in any department/program. Students should contact faculty members individually to inquire about opportunities available and provide information on their background. The supervising faculty can provide further information about payroll procedures.

### **Teaching Assistant Positions**

There are several levels of teaching assistant opportunities available for AiCE students. For complete information please seek advice and counsel from the academic advisor.

## **ENROLLMENT AND DEGREE CERTIFICATION**

### **Enrollment Verifications**

The Hub (<https://www.cmkl.ac.th/hub>) is the primary contact for students or alumni who would like to request a transcript, enrollment verification, or other information related to their time in AiCE.

AiCE may provide a letter to verify some limited information, which may be suitable for some purposes, such as the verification of skills students acquired through the AiCE program. Please contact your academic advisor for more information.

### **Leave of Absence**

Students may need to interrupt their studies for a variety of reasons (financial, academic or personal). Students choosing to take a leave of absence must first contact their advisor to discuss their plans while on leave to work out any conditions that may be necessary for a smooth return to CMKL.

A student may leave CMKL by either withdrawing from the university (this means leaving the university with no intention of returning) or by taking a leave of absence (this means leaving the university temporarily, with the firm and stated intention of returning). A Leave of Absence Form must be completed by all students requesting a leave of absence. A Withdrawal Form must be completed by all students who are withdrawing. Notifying instructors or no longer attending classes does not complete the process.

Forms are available on The Hub website. Not completing the leave form will result in tuition being charged to midpoint of the semester or the last date the student attended an academically-related

activity such as an exam, tutorial or study group, or the last day a student turned in a class assignment.

### **Returning from a Leave of Absence**

Students on leave who wish to return to CMKL to resume their degree studies may do so under several conditions. In order to be considered for return from leave, a student must first obtain an Application for Return form from the Hub. This application requires information from the student regarding the intended semester of return, current address information and information about their leave. This application must be submitted to Hub at least one month prior to the beginning of the semester. Graduate students may return to the AiCE program within two years. After two years, students returning are subject to space constraints and academic performance review.

Per university policy on student leaves, students on leave are not permitted to live in university housing, attend classes or maintain employment as students at CMKL while their leave is in effect.

Note also that international student taking a leave of absence will lose their Educational Visa and be required to leave Thailand.

### **Degree Certification Process and Commencement**

A student must satisfy all degree requirements and achieve a minimum of 3.0 QPA in the courses being applied towards the required 96 units from CMKL and 97 units from CMU to be eligible for degree certification. In addition, students must have provided a final copy of their undergraduate transcript(s) and must have a tuition balance of THB 0.00 to receive a diploma. CMKL Commencement only occurs once a year. AiCE holds a diploma ceremony at the same time as the university. Students who are certified after the annual ceremony will be invited to attend the next commencement ceremony

Before graduation, students should update their contact information, such as mailing address and e-mail address, with the university. Also, students should review a proxy of their diploma to verify the information displayed there, such as the spelling of their name.

The title of the degree students receive is Master of Science in Artificial Intelligence and Computer Engineering.

## **ACADEMIC STANDARDS**

### **Grades**

Below are the policies surrounding grades for students in M.S. in AiCE program.

### **University Policy on Grades**

The university policy on grading offers details concerning university grading principles for students studying in the program and covers the specifics of assigning and changing grades, grading options, drop/withdrawals and course repeats. It also defines the graduate standards.

## **Grading Policy**

AiCE follows the following letter grade scale. The letter grade scale is 'A' (highest), 'A-', 'B+', 'B', 'B-', 'C+', 'C', 'C-', 'D+', 'D', and 'R' (lowest). Grades lower than 'B-', meaning C or below, are considered failure in AiCE and will not count toward degree requirements.

Individual instructors may decide to omit some of the intermediate grade levels (plus or minus levels).

## **Academic Performance**

### **Quality Points Average**

In order to graduate, each student must have a Quality Point Average (QPA) of at least 3.0 in the courses being used towards the required 96 units. Coursework or graduate project units with a grade lower than 'C' will not be considered toward graduate degree requirements. However, they will be calculated into the student's cumulative QPA.

### **Academic Probation**

In the event that a student's semester or cumulative QPA falls below a 3.0, that student will be considered to be on academic probation and will receive a letter from the department alerting them. While on probation, students must meet with their academic advisor and comply with their recommendations. Once a student's semester and cumulative QPA increase above 3.0, the student is automatically removed from probation.

### **Academic Integrity**

Students at CMKL are engaged in preparation for professional activity of the highest standards. Each profession constrains its members with both ethical responsibilities and disciplinary limits. To assure the validity of the learning experience a university establishes clear standards for student work.

AiCE adheres to CMKL's policies on academic integrity and all students are expected to review these policies prior to their arrival at CMKL.

In any presentation, creative, artistic, or research, it is the ethical responsibility of each student to identify the conceptual sources of the work submitted. Failure to do so is dishonest and is the basis for a charge of cheating or plagiarism, which is subject to disciplinary action.

The active learning focus of the AiCE program places even more stringent demands on students' integrity. Since students will demonstrate mastery largely via creation of designs, programs, and systems, the student will need to rely on external sources and information. It is critical that students identify what work is their own and what work is derived from other sources. Furthermore, students must adhere to instructors' guidelines regarding what types of external sources are permitted

Finally, some work at CMKL will be done in teams, while other work will be individual. Students should note that an individual assignment must be solely their own work. Copying of any sort on an individual assignment is a violation of ethical standards and will be subject to severe penalties.

### **Penalties for Violating Academic Integrity**

Instructors are responsible for defining academic integrity for students in their courses, including student performance expectations and attendance requirements. Students are responsible for understanding and abiding by the instructor's academic integrity policies. Policies may vary from instructor to instructor and students should seek further guidance from a faculty member if they have specific questions about a course's academic integrity policy.

Should an instructor believe that an academic integrity violation has occurred, he or she may consult with the Office of the Dean of Student Affairs, who will assist the faculty member in handling a possible academic integrity violation and, if a student is found responsible for violating academic integrity policies, determining possible sanctions. Sanctions may include being required to redo work, losing credit and/or public admissions of guilt.

If a student is found to have violated the academic integrity policy for a second time, the student will be dropped from the AiCE program at the end of the semester in which the infraction has occurred.

Students have the right to appeal an academic integrity decision.

## **M.S. AiCE DEGREE REQUIREMENTS**

### **Overview**

AiCE students must satisfy multiple requirements before the Master of Science degree is certified.

The M.S. in AiCE is a three-semester program that is offered with two study tracks: professional track & thesis track. Student will have to choose between one of them. The requirements for each track are described below.

### **Professional Track**

This track is comprised of 96 units; 84 units of graduate course work and 12 units of Research and Innovation. The required units are broken down as follows:

- 60 units of AiCE core courses
- 24 units of General technical elective courses
- 12 units of Research and Innovation

Up to 12 units of advanced undergraduate course work (third or fourth year courses) can qualify to be substituted toward the 84 units of core or elective requirements. Qualifying coursework must be offered by the AiCE undergraduate program.

A. AiCE core coursework: 60 units  
60 units must be graduate coursework within AiCE.  
AiCE, CMKL University (CMKL 41-XXX)

**B. CMKL elective coursework: 24 units**

24 units of coursework can be from the following programs (shown under their parent program) or individually approved courses:

- ECE (CMKL 18-XXX)
- EIC (CMKL 56-XXX)

**C. Research and Innovation: 12 units**

12 units of research, entrepreneurship and innovations are required (CMKL41-900). This unique requirement offers students the opportunities to participate in ongoing real-world projects with university partners and preparing the students for future academic and industrial careers.

## Thesis Track

This track is comprised of 96 units; 36 units of graduate course work and 60 units of Research and Innovation (Thesis-based). In this track of master's, you are expected to conduct original research under a faculty advisor and make your contribution to the already available body of knowledge.

The required units are broken down as follows:

- 24 units of AiCE core courses
- 12 units of CMKL elective coursework
- 60 units of Research and Innovation (Thesis-based)

You will be required to present and defend your thesis in front of a committee of up to three instructors.

Up to 12 units of third or fourth year undergraduate course work can qualify to be substituted toward the 36 units of core or elective requirements.

**A. AiCE core coursework: 24 units**

24 units must be graduate coursework within AiCE .

- AiCE, CMKL University (CMKL 41-XXX)

**B. CMKL elective coursework: 12 units**

12 units of coursework can be from the following programs (shown under their parent program) or individually approved courses:

- ECE (CMKL 18-XXX)
- EIC (CMKL 56-XXX)

**C. Research and Innovation: 60 units\***

At least 60 units of research, entrepreneurship and innovations are required. This unique requirement offers students the opportunities to conduct methodical, systematic, theory-based, and collaborative research with a diversity of outstanding people, in a multitude of leading facilities and stimulating environments.

Requirements:

1. Research, Entrepreneurship and Innovation (CMKL41-900): 12 units
2. Research and Development (CMKL41-910): 48 units

The Research and Development credits must be devoted to proposing, researching and writing a master's thesis. The final thesis must be defended to and accepted by a thesis committee of at least three instructors.

## **INTEGRATED B.ENG./M.S. in AiCE**

The Integrated Master's/Bachelor's program (otherwise known as the IMB program) allows students who excel academically as bachelor's degree students to achieve both a Bachelor's and Master's degree in AiCE through our M.S. degree program without needing to apply separately. This means no application fee, no recommendation letters, and no need to take the GRE (Graduate Record Exam).

Eligible students begin by completing their B.Eng degree in AiCE, and can either complete the M.S. degree at the same time or over the next few semesters. If a course is eligible for the M.S. degree but must be used to complete the BS degree, then the BS degree takes priority over the MS degree. If suitable progress towards completing the B.S. is not made, the M.S. cannot be granted regardless of whether or not a student fulfills all M.S. graduation requirements. BS students must complete their degree requirements and graduate before they can be classified as a graduate student. Some courses will require graduate student status before a student can register for them. In the case of M.S. research projects, an IMB student can only register for the graduate version in their senior year and with written approval from their research instructor confirming the work is at an appropriate rigor for M.S. students.

Undergraduate AiCE students with a 3.00 QPA or above automatically become eligible for the IMB program in the second semester of their junior year once they have completed at least 270 units. To be officially admitted, students must attend an IMB info session and sign a declaration form. IMB info sessions are offered twice per semester and all juniors and seniors receive an email in the first few weeks of classes with that semester's dates. Students who meet all requirements for the IMB program can sign up at the session. The deadline to sign up for the IMB program for students who meet all requirements is the end of November for the fall semester and the end of April for the spring semester.

Undergraduate students with a 2.50 to 2.99 QPA may petition to enter the IMB program in their final semester. These students must get the approval of their undergraduate advisor, as well as attending an IMB information session. Students in this situation should obtain a petition form from their undergraduate advisor, complete this form, and submit to their advisor by October 31st in the fall semester and March 31st in the spring semester. To obtain the petition form, students can contact their undergraduate academic advisor.

Students with below a 2.5 QPA are not eligible for the IMB program.

The information sessions for the Spring 2022 semester will be held on Monday, 7 February 2023, Tuesday, 8 February 2023, and Wednesday, 9 February 2023. AiCE juniors and seniors, will receive email with additional details. If you are unable to attend an information session due to a class conflict, please contact your academic advisor.

## Degree requirements

The graduate level requirements for the integrated B.E. and M.S. degree are the same as for the Professional MS degree discussed above. For students in the AiCE IMB program, all requirements for the MS degree are in addition to the requirements for the B.Eng in AiCE. No requirements for the M.S. degree may be used in any way toward the B.Eng degree.

Students will be committed to the M.S. curriculum requirements that exist at the time that they sign their declaration form.

Once a student in the IMB program has completed all of the requirements for the B.Eng degree, they may become a graduate (Masters) student. To do this, the student's undergraduate degree is certified, and that student officially graduates with the B.Eng degree. Once a student's undergraduate degree has been certified, no more courses may then be applied toward the B.Eng degree. This includes courses toward minors and additional majors, although students pursuing an undergraduate dual degree with another department may still continue to apply additional coursework toward that second degree.

If a student takes more than eight semesters to complete both the B.Eng and MS degrees, then they must be a graduate student for at least one semester before graduating.

To determine the most appropriate time to become a graduate student, an undergraduate student should consult a) with The Hub to consider how becoming a graduate student will affect financial aid, and b) with their academic advisor to determine a course schedule. Once a student has official graduate student status through the IMB program, he or she is eligible to work for the department as a paid Teaching Assistant.

## EXCHANGE AND TRANSFER PROGRAMS

### Internship Course Option

AiCE students may wish to participate in paid internships at off-campus organizations in Thailand during the summer months. AiCE will enroll all students who are pursuing an internship for a 3-unit credit bearing internship course (CMKL41-995 Internship for Artificial Intelligence and Computer Engineering Graduate Students), which can be taken once throughout the student's AiCE M.S. degree program of study, and is offered only during the summer. This internship will appear on a student's CMKL transcript and tuition will be charged for 3 units. The work for the internship must be appropriate to the goals of the academic program.

### University Credit Transfer and Student Exchange Programs

Current AiCE students taking courses at other accredited institutions (colleges and universities), as part of exchange programs or other departmentally approved programs, or while on leave from CMKL, must arrange for the submission of official final transcripts to the University Registrar's Office. Upon receipt, Enrollment Services will verify these official transcripts then send a copy of

the transcript to the AiCE program committee, who will make the transfer credit decisions. The official transcript will reside in the student's university academic folder in Enrollment Services.

### **AI Engineering Institute University Network**

Students participating in the study through AI Engineering Institute's (AIEI) university network can request for credit transfer directly using AIEI system in lieu of submitting the transcript. Students can also request for a dual, or multiple-degree program evaluation to be considered for additional degree recipients from other host universities through AIEI. Note that the students must complete AiCE program requirement in order to receive CMKL degree.

## **POST-MATRICULATION GUIDELINES**

### **Return of University Property**

AiCE students must return all borrowed university materials—such as software, manuals, library books/materials, or any other CMKL University property—prior to their departure from the program.

### **Career Services Employment Outcomes**

AiCE students are asked to complete and return a survey for Career Services updating CMKL on their employment outcomes after graduation. Information about the survey is communicated in the students' final semester.

### **“Grandfather” Clause**

When policies are changed, it is because the program believes the new rules offer an improvement; any such changes will be communicated to students. In case degree requirements are changed and certain courses are no longer offered, the program will try to find some compromise that allows those students to satisfy the original requirements.

## **TUITION AND FEES**

Unless scholarship and financial-aid packages are arranged and approved in advance, AiCE students are full-time and will be charged full-time AiCE tuition. Total charges for a period of attendance and estimated schedule of total charges for entire educational program can be found on the financial service website: <https://www.cmkl.ac.th/hub/financial-services/overview>

All charges incurred at the university are reflected in the student account. Charges include tuition and fees and may include health insurance, technology fee, transportation fee, student activities fee and other miscellaneous charges incurred. Miscellaneous charges may include, but are not limited to, library fines, parking fines, or emergency loans.

The university also offers a need-based assistance for financial aid as well as merit-based scholarships. Interested students are advised to designate their requirement in the application form.

### **Tuition Billing and Payments**

The tuition rate for students entering AiCE programs is set in the spring for the class entering in the following fall semester. Tuition for a student's second fall semester will likely increase in

accordance with the tuition increase for the new academic year. The tuition will increase approximately 3% per year.

Students will be charged tuition per semester for each semester in which they are enrolled. The tuition and required fee billing are handled centrally by CMKL University finance department.

Student account invoices are produced on the last day of each month. Invoices detail all transactions processed in the month, as well as any charges due in the future. Students receive an email notification to their CMKL email account when an invoice is ready for viewing on the Hub system. Payments for amounts due from a monthly invoice must be received by the 15th of the next calendar month. Any amounts not paid by the stated due date are subject to a 1.5% interest charge each month until the balance is paid in full.

## **CONCLUSION**

CMKL University is ready to welcome promising and proactive students who want to prepare themselves for the challenges of tomorrow. We hope that this handbook has answered your questions about our philosophy, policies and curriculum. Should you have any questions or concerns, please do not hesitate to contact us.

+66-65-8785000  
info@cmkl.ac.th

## **APPENDIX A: LIST OF PROGRAM COURSES**

Courses offered at CMKL University

The following courses are offered in Thailand at CMKL (additional courses may be added later).

### **Foundations of Computer Systems (CMKL41-613) – 12 Units**

This course provides a programmer's view of how computer systems execute programs, store information, and communicate. It enables students to become more effective programmers, especially in dealing with issues of performance, portability and robustness. It also serves as a foundation for courses on compilers, networks, operating systems, and computer architecture, where a deeper understanding of systems-level issues is required. Topics covered include: machine-level code and its generation by optimizing compilers, performance evaluation and optimization, computer arithmetic, processor architecture, memory organization and management, networking technology and protocols, and supporting concurrent computation. This course prepares students for other graduate level computer systems courses as well as working in the industry.

### **Introduction to Information Security (CMKL41-631) – 12 Units**

Our growing reliance on information systems for daily activities, ranging from remote communications to financial exchanges, has made information security a central issue of our critical infrastructure. The course introduces the technical and policy foundations of information security. The main objective of the course is to enable students to reason about information systems from a security engineering perspective, taking into account technical, economic and policy factors. Topics covered in the course include elementary cryptography; access control; common software vulnerabilities; common network vulnerabilities; policy and export control laws, in the U.S., Japan, and elsewhere; privacy; management and assurance; economics of security; and special topics in information security. Prerequisites: The course assumes a basic working knowledge of computers, networks, C and UNIX programming, as well as an elementary mathematics background, but does not assume any prior exposure to topics in computer or communications security. Students lacking technical background (e.g., students without any prior exposure to programming) are expected to catch up through self-study

### **Foundations of Software Engineering (CMKL 41-652) – 12 Units**

In this course, you will learn about software engineering paradigms that have shaped the software industry over the past few decades. You will be exposed to fundamental disciplines of software engineering as well as engineering practices that crosscut system, project, and user perspectives. You will learn to iteratively define requirements, and architect, design, implement, integrate, test, and deploy a solution. You will work on self-organizing teams and manage the work collaboratively. You will also learn to solve a real problem subject to multiple constraints while keeping the stakeholders involved throughout the lifecycle and balancing the underlying engineering tradeoffs. The topics are applied in the context of a semester-long group project. Please note that this course is intended for AiCE master students with a concentration in Software Engineering and will satisfy the "Software Engineering and Design" course area requirement. Prerequisites: Basic software development experience with proficiency in at least one modern programming language and modern programming concepts. Prior to admission, students must successfully complete a programming assignment to demonstrate familiarity with required software

technologies. Students who have successfully completed 41-652, Foundations in Software Engineering, are not eligible to take this course.

### **Software Requirements and Interaction Design (CMKL41-658) – 12 Units**

This course addresses software design challenges by integrating two disciplines: requirements engineering and interaction design. Students learn to combine user research, design-based ideation and validation, and requirements definition, within an agile software development process. Students apply this knowledge during a semester-long project. Their goal is to envision and implement the first version of an innovative software system that could make a unique contribution to society. The system should address a real problem, satisfy real stakeholders' needs, and provide a superior user experience. Students collaborate closely with their stakeholders throughout the project for needs elicitation, design concepts validation, and usability testing.

### **Introduction to Machine Learning for Engineers (CMKL41-661) – 12 Units**

This course provides an introduction to machine learning with a special focus on engineering applications. The course starts with a mathematical background required for machine learning and covers approaches for supervised learning (linear models, kernel methods, decision trees, neural networks) and unsupervised learning (clustering, dimensionality reduction), as well as theoretical foundations of machine learning (learning theory, optimization). Evaluation will consist of mathematical problem sets and programming projects targeting real-world engineering applications. This course is intended for AiCE master students with a concentration in Software Engineering. It is a core course of the MS-SE program satisfying the "Software Engineering and Design" course area requirement.

### **Hardware/Software Co-design (CMKL 41-701) – 12 Units**

This course explores how software and hardware come together to implement computer systems. The course will be extremely hands-on, with weekly development cycles. Students will learn a new concept within the language/processor stack (e.g., parsing) and will be expected to implement it by the following week. At the end of the course, each student will have a working version of a compiler, interpreter, and processor, that can all work in tandem with each other.

### **Introduction to Computer Security (CMKL41-730) – 12 Units**

This course provides a principled introduction to techniques for defending against hostile adversaries in modern computer systems and computer networks. Topics covered in the course include operating system security; network security, including cryptography and cryptographic protocols, firewalls, and network denial-of-service attacks and defenses; user authentication technologies; security for network servers; web security; and security for mobile code technologies, such as Java and JavaScript. More advanced topics will additionally be covered as time permits, such as: intrusion detection; techniques to provide privacy in Internet applications; and protecting digital content (music, video, software) from unintended use.

## **Computer Architecture and Systems (CMKL41-742) – 12 Units**

Historically, the performance and efficiency of computers has scaled favorably (according to "Moore's Law") with improvements at the transistor level that followed a steady trend (so-called "Dennard scaling"). Unfortunately, device scaling has hit a limit on performance and power improvements dictated by physical device properties. To continue to make systems capable, fast, energy efficient, programmable, and reliable in this "post-Dennard" era, computer architects must be creative and innovate across the layers of the system stack. This course begins with a recap of conventional, sequential computer architecture concepts. We will then discuss the end of convention, brought about by the end of Dennard Scaling and Moore's Law, and several trends that these changes precipitated. The first trend is the wholesale shift to parallel computer architectures and systems, covering parallel hardware and software execution models, cache coherence, memory consistency, synchronization, transactional memory, and architecture support for programming, debugging, and failure avoidance. The second trend is the shift to incorporating specialized, heterogeneous components into parallel computer architectures. Topics will include reconfigurable architectures, FPGAs in the datacenter, ASIC accelerators, GPGPU architectures, and the changes to the system stack that these components demand. The third trend is the emergence of newly capable hardware and software systems and new models of computation. Topics will include approximate and neuromorphic computing, intermittent computing, emerging non-volatile memory and logic technologies, and analog and asynchronous architectures, and may include future emerging topics.

## **Packet Switching and Computer Networks (CMKL41-756) – 12 Units**

This course is designed to provide graduate students an understanding of the fundamental concepts in computer networks of the present and the future. In the past, the scarce and expensive resource in communication networks has been the bandwidth of transmission facilities. Accordingly, the techniques used for networking and switching have been chosen to optimize the efficient use of this resource. These techniques have differed according to the type of information carried: circuit switching for voice and packet switching for data. It is expected that elements of circuit and packet switching will be used in the integrated networks. This course focuses on packet switching for computer networks and protocol design. Topics in the course include: computer networks over-view; OSI layers, queuing theory; data link protocol; flow control; congestion control; routing; local area networks; transport layer. The current networks and applications will be introduced through the student seminars in the last weeks of the course.

## **Network Management and Control (CMKL41-757) – 12 Units**

This course provides an understanding of the principles of broadband networks. The broadband networks differ from currently existing communication networks in many aspects and these issues will be dealt with in the course. Broadband networks are designed to support many different services, ranging from low bandwidth (telemetry) to high bandwidth applications (digitized video). The course will cover the underlying concepts of the broadband networks, and expose the research problems in next generation networks. Many concepts (SDN, MPLS, high-speed switching architecture, high-speed network control, unified control plane, and optical networks) will be discussed. The course project will explore latest network technologies, design networking systems, and evaluate via simulation techniques.

## **Image and Video Processing (CMKL41-793) – 12 Units**

This course covers signal processing techniques specialized for handling 2D (images) and 3D (videos) signals. It builds upon 1D signal processing techniques and specializes them for the case of images and videos. In this class, you will learn fundamental tools and techniques for processing images and videos, and will learn to apply them to a range of practical applications. This course provides the fundamentals for studying images and videos. We will develop signal models specific to images and videos, develop associated optimization techniques for solving restoration problems like denoising, inpainting, study specialized compression algorithms. Specific focus will be on transform-domain, PDE and sparsity-based models and associated optimization techniques. These formal techniques will be enriched via applications in mobile devices, medical image processing, and compressive sensing.

## **Research, Entrepreneurship and Innovation requirement**

### **Research, Entrepreneurship and Innovation (CMKL41-900) – 12 Units**

This unique course for AiCE program introduces students to explore the connections between research, entrepreneurship and innovation. Students will be introduced to industries and tech communities. Students will participate in exploratory projects which introduce research methodologies while also learning how to apply engineering techniques to solve challenging real-world problems.

### **Research and Development (CMKL41-910) – 36 Units**

Students in AiCE programs will have the opportunity to participate in real-world supervised research and development projects. Students are encouraged to participate in existing projects with the university partners to gain professional experience in R&D.

### **Internship for Graduate (CMKL41-995) – Variable**

Artificial Intelligence and Computer Engineering program considers experiential learning opportunities important educational options for its graduate students. One such option is an internship, normally completed during the summer. The AiCE Graduate Office will add the course to the student's schedule. This process should be used by any AI and Computer Engineering graduate student wishing to have their internship experience reflected on their official University transcript. International students should also be authorized by the program representatives. Completion of written assignments and requirements will determine the letter grade for the course.

### **Graduate Teaching Internship (CMKL41-999) – 12 Units**

The Teaching Internship for AI and Computer Engineering MS Students represents the capstone or culminating experience at CMKL University in the preparation of prospective lecturers as knowledgeable, reflective practitioners and emerging leaders who conduct themselves ethically and professionally. The semester-long internship provides MS Students many opportunities within diverse classroom settings to refine the knowledge, skills, and dispositions they have developed as active participants in Electrical and Computer Engineering Program. A teaching assignment with major responsibility in the classroom for MS Students in AiCE course.

## **M.S. in Technology and Creative Innovation**

AiCE Approved Course for Research and Innovation

### **Building Virtual Worlds (CMKL 41-953) – 12 Units**

Create a new world in just two weeks. Modeling our class after the groundbreaking ETC course by co-founder Randy Pausch, Building Virtual Worlds (BVW) challenges students to work quickly, creatively, and collaboratively. Part of the immersion semester, BVW gives small teams of students two weeks to create a virtual world and/or explore productions and projects in various mediums in entertainment. It all culminates in a public festival to hundreds of spectators – and an incredible sense of accomplishment. In fact, many BVW ideas go on to become full-time research projects, student spin-offs and commercial successes.