Aice

AI +
COMPUTER
ENGINEERING

CMKL
UNIVERSITY

Bachelor of Engineering in

Artificial Intelligence & Computer Engineering

AI Engineering Bachelor Program

Thailand's first integrated degree in the emergent field of artificial intelligence engineering to enabling AI applications for real-world problems

Carnegie Mellon University – CMKL | Thailand

About CMKL University

Established on October 25, 2017 with the collaboration between Carnegie Mellon University & King Mongkut's Institute of Technology Ladkrabang.

Carnegie Mellon University
CMKL | Thailand

Carnegie Mellon University
Carnegie Mellon University
College of Engineering
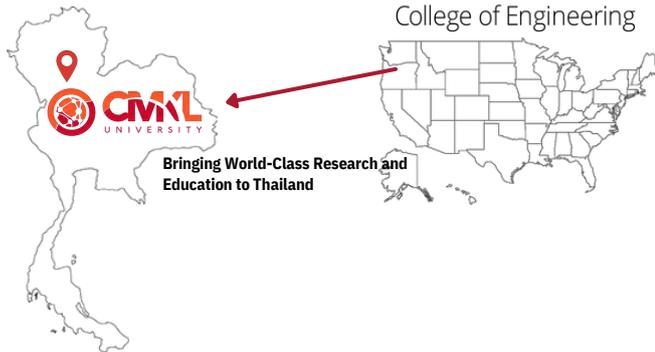
Bringing World-Class Research and Education to Thailand

#1 Artificial Intelligence	#3 Computer Systems	#3 Graduate Computer Engineering	#3 Data Analytics/Science	#1 Cyber-Security
U.S. News & World Report 2020	U.S. News & World Report 2020	U.S. News & World Report 2020	U.S. News & World Report 2020	U.S. News & World Report, 2020

#2 Computer Science	#1 Software Engineering
U.S. News & World Report 2020	U.S. News & World Report 2020

Carnegie Mellon University
TARTANS

Carnegie Mellon University
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Global Partnerships
Carnegie Mellon College of Engineering Programs

SILICON VALLEY, CA

PITTSBURGH, PA

PORTUGAL

KOBE, JAPAN

BANGKOK, THAILAND

KIGALI, RWANDA

Our Leadership
Board of Trustees

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Secretary
President, CMKL University

CMKL
UNIVERSITY

What is B.Eng. in AiCE

What We Focus On ?

A — AI Engineering

Learn to engineering and implement AI systems in impactful contexts.
Adopted Carnegie Mellon University's Software Engineering Institute for AI Engineering Initiatives to build 3Es at AiCE
· Engineering Experts
· Entrepreneurial Innovators
· Ethical Leaders

i — Intelligence APEX Supercomputer

Access resources include APEX supercomputer to enable computation at scale. APEX AI Supercomputer, first & largest node in university AI research infrastructure in SEA in partnership with NVIDIA and DDN

C — Competency-Based AI Curriculum

Tailor your education to your unique needs and interests through a competency-based curriculum
Continuous Assessment : On-going assess based on proof of mastery, What you can do, not what you can remember

E — Ecosystem Access for AI Innovation

Access to the CMU ecosystem. Exchange/ Internship programs at Carnegie Mellon University, USA for 1-2 semesters
Joining Technology Trends workshops/ seminars at world top company in the US

AI Engineering
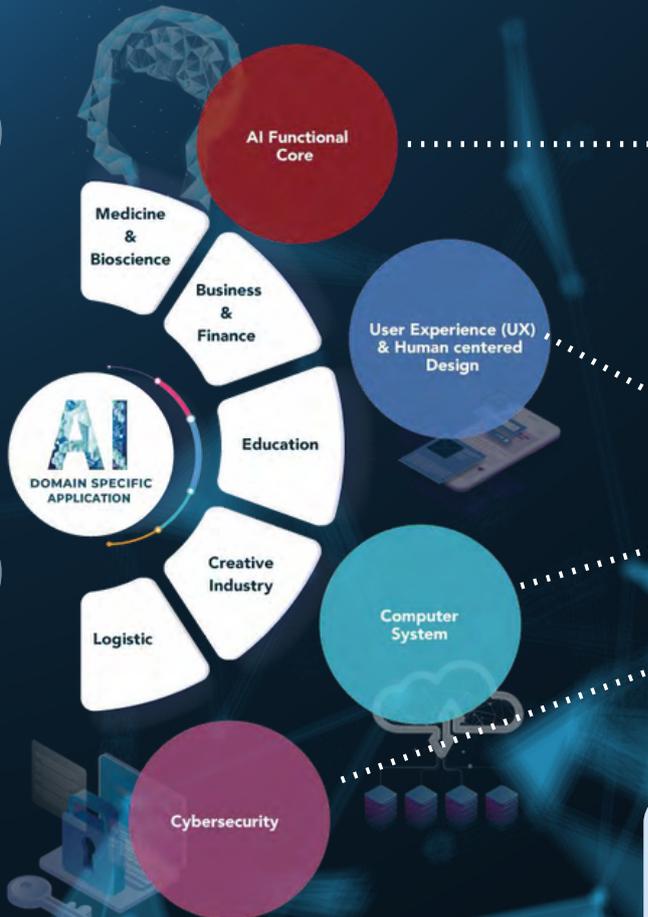
AI Engineering*

AI engineering is an emergent field of research and practice that combines the principles of software engineering, systems, computer science, and human-centered design to enable implementation of AI systems in accordance with human needs for mission outcomes. While much work to date has focused on AI capability development, AI engineering asks what is needed to develop, deploy, and maintain AI systems in unpredictable and chaotic environments.*

Pillars of AI Engineering

⚙ **Human-centered AI:** Key to the implementation of AI in context is a deep understanding of the people who will use the technology. This pillar examines how AI systems are designed to align with humans, their behaviors, and their values.

⚙ **Scalable AI:** Effective AI systems require large investments of time and money to develop. This pillar examines how AI infrastructure, data, and models may be reused across problem domains and deployments.

⚙ **Robust and Secure AI:** One of the biggest challenges facing the broad adoption of AI technologies and systems is knowing that AI systems will work as expected when they are deployed outside of closely controlled environments. This pillar examines how we develop and test resilient AI systems.

"AI Engineering is an emergent discipline focused on developing tools, systems, and processes to enable the application of artificial intelligence in real-world context."

- National AI Engineering Initiative, Software Engineering Institute

* AiCE Curriculum designed to support AI Engineering Initiative by Carnegie Mellon Software Engineering Institute. CMKL University is a licensed SEI Partner providing official SEI services in CERT/CC suite.

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SEI Partner Network

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AiCE Curriculum

AiCE AI + COMPUTER ENGINEERING

AI Functional Core

DOMAIN SPECIFIC APPLICATION
- Medicine & Bioscience
- Logistic
- Business & Finance
- Creative Industry
- Education

- Cybersecurity
- User Experience (UX) & Human centered Design
- Computer System

Pillar AI:
- Representation
- Machine Learning
- Deep Learning
- Transformers
- Natural language processing
- Computer Vision
- Autonomous System
- Recommendation System

Pillar Security:
- Robust AI, Generative Advisorial Network
- Secure Computing
- Blockchain, Privacy
- Bias
- Zero trust model
- Attack & defense
- Cyber risk & Governance

Pillar Design:
- Human-centered AI
- UX/UI design
- XR (Virtual/Augmented/Mixed reality)
- Game and Interactive applications
- Software engineering & design patterns
- Accessibility

Pillar System:
- Accelerated Computing
- Scalable AI, Distributed Systems
- High Performance
- Computing, Container & Cloud-native computing
- AI/MLOps, Network
- Cyber-physical system

Entrepreneurship and Professionalism Thread :
"Integrative Skills"

Continuing Professional Development / Communication / Teamwork / Economic Considerations / Privacy and confidentiality / Ethical Considerations / Legal considerations / Intellectual property / On Automation

"Innovation Projects"   **"Deep-Tech Projects"**   **"AI for Society"**

The Power of 3

3Cs
Learning Environment

- **Cohort** - having a strong sense of community and peers/support.
- **Colleague** - connect with colleagues of different backgrounds and expertise (MS/PhD, engineers, partners)
- **Coach** - Learn from world-class professors who will accompany your journey ensuring your academic and professional success.

3Es
Graduate Traits

AiCE 3*3*3

- **Entrepreneurial Innovators :** for self-starting individuals who are eager to pursue their own businesses or startups.
- **Engineering Experts :** for students who want to dive deeper into a higher level of AI study and building cutting-edge technology.
- **Ethical Leaders :** for students who want to be future leaders / policy makers, creating positive impact with solid technical background

3Ps
Integrative Skills

- **Innovation Projects:** Student-driven project: the students can choose to start the project based on their passions/ interests
- **Deep-Tech Projects:** Cutting-edge technology driven by industry.
- **AI For Society Projects:** AI for Social Good Projects: Create AI projects that are beneficial to society.

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AiCE Curriculum

AI Engineering

PERSONALIZED LEARNING CURRICULUM

3-YEAR ACCELERATED STUDY PLAN IS AVAILABLE

ACCESS TO THE BEST IN-CLASS FACILITIES AND AI SUPERCOMPUTING.

JOIN EXCHANGE PROGRAM AT CARNEGIE MELLON UNIVERSITY

Our competency-based AI and Computer Engineering program is created by academics in collaboration with industry professionals to guarantee that you obtain relevant skills to help you stand out in the AI Engineering field and advance your career at your own pace.

Accelerate Your Development of Competence Through A Self Paced Personalized Learning

REAL-WORLD TASK

A task that measures your knowledge through industry-driven practical application in real world context.

BITE-SIZED MODULE

Chunking course content into modules. A flexible way of learning. More personalized.

COMPETENCIES

Knowledge, skills and dispositions that students are expected to gain from a bite sized learning module.

CONTINUOUS ASSESSMENT

An on-going assessment that students' mastery of competencies will be evaluated throughout their journey.

MASTERY

Students are evaluated based on how well they demonstrate each of the criteria of task assigned.

COMPETENCY DECK

A personalized dashboard that shows students their academic progress on each competency.

RECOMMENDATION

Mentors select the next task for the learner, give a challenge in areas not yet mastered, and practice.

PEER-LEARNING

Learning partnerships, promotes collegiality and develops a sense of mutual accountability among the students.

WE BUILD

Engineering Experts
Entrepreneurial Innovators
Ethical Leaders

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APEX Supercomputer

National AI Research Platform & Data Exchange

R&D Support from PMU-C; Office of National Higher Education Science Research and Innovation

Policy Council (NXPO); Ministry of Higher Education, Science, Research and Innovation

- **Apex - AI Supercomputer**
  - First & largest node in university AI research infrastructure
  - Partnership with Nvidia and Data Direct Network

- **System overview**
  - 30 petaFLOPS AI (FP16) / 936 teraFLOPS (FP64)
  - 1920 CPU cores / 48 A100 GPUs
  - 7.3 TB system memory + 1.92 TB GPU memory
  - 3 PB storage
  - 100 GbE Open Ethernet

AiCE Curriculum

AiCE Program Experience

Year		
Year 1	Foundation / Preparatory Program	Explore
Year 2	Engineering Breadth / Technical Core	Build: Prototyping
Year 3	Domain Specialization	Apply: Design & Development
Year 4	Capstone	Connect: R&D + Stakeholder Engagement
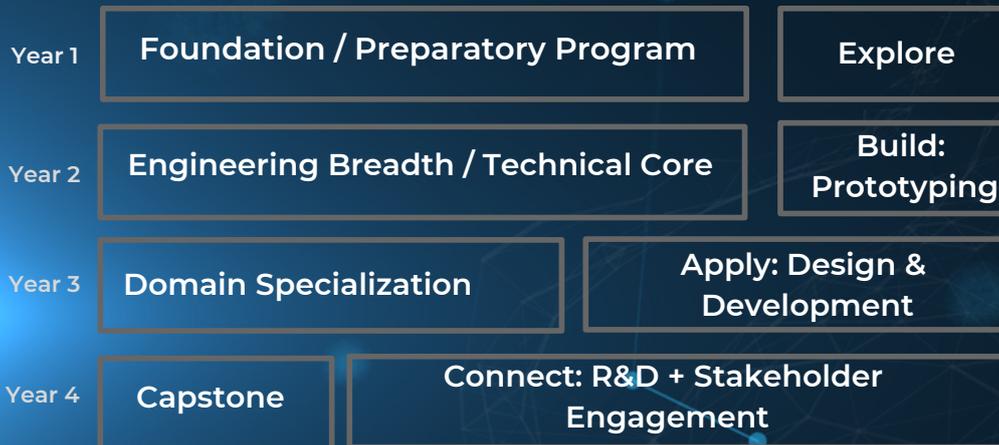
3-year Accelerated Study Plan

"The three-year accelerated study plan is a great way for a motivated student to earn a B.Eng in AiCE a shorter span of time, particularly for those who enter CMKL with Pre-matriculant credits such as Advanced Placement, International Baccalaureate, or college credits earned during high school"

Exchange and Internship @ CMU/CMKL

- Opportunities to participate in world-class research groups which often collaborate with various industries. You have opportunity to get hands on experience of the world of research.

- A chance to study in prestigious undergraduate classes for a semester or participate in a summer research internship. You will earn experiences at Carnegie Mellon University.

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AiCE Curriculum

Experiential Learning Through R&D Research

Our students have an opportunity to participate in projects with leading industries and tech companies. At CMKL, students will have a hands-on experience while networking with professionals in the field, preparing them for their future careers.

Centers of Excellence

(workshop, training, share technical knowledge and use-cases with the communities around the world)

NVIDIA

Improve AI algorithms for better performance and faster with their open source initiatives in many areas e.g. images recognition, video processing, speech recognition, etc.

ddn

Accelerate I/O Performance for AI Applications with their open-source filesystem

IoT/App · Practical AI · Design · System · Security

Partners: ThaiBev · UWU. · BETAGRO · ETDA www.etda.or.th · PTTEP · SEC · KBTG · AIS · THE MONK STUDIOS · Bangkok Bank

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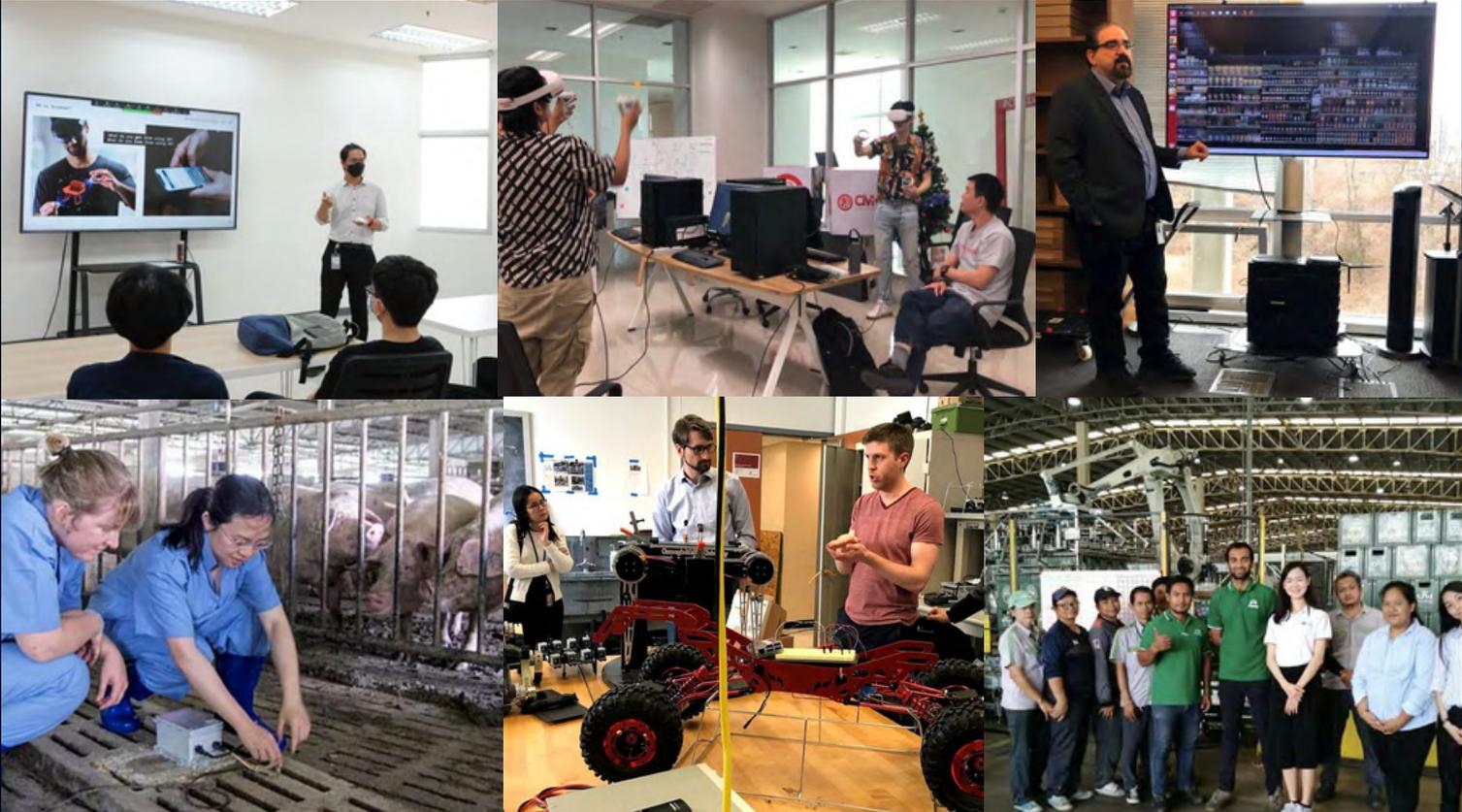
Destination for AiCE students

What are the job opportunities in the field?

Where AiCE Will Take You

AiCE curates relationships, educational experiences and resources to help you succeed in the job market upon graduation. Collaborative projects and research will put you in contact with industry experts and alumni so you can envision your future.

$102,450
Average Annual Base Salary
*computercareer.org (source)

฿720,000
Average Annual Base Salary
*marketingoops.com

Direct Pathway to MS/PhD in ECE Carnegie Mellon University

Electrical & Computer ENGINEERING

TOP CAREERS

- AI/ Machine Learning Engineer
- AI Data Analyst
- Data Engineer
- Computer vision engineer
- Algorithm developer Developer consultant
- Cyber Security
- Big Data Engineer
- Software Engineer
- Systems Engineer
- Data Scientist
- UX Engineer
- MLOps Engineer
- Operations for Human-AI Interactions
- Startup Founder

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AiCE Admission

Important Dates & Timeline

Early Enrollment*

Application Deadlines	before January 15
Interview Date	within 3 weeks of completing the application
Notified by	within 4 weeks of completing the application
Enrollment confirmed by	within 3 weeks after receiving the decision notification

Early Decision

Application Deadlines	November 1
Interview Date	November 13
Notified by	December 15
Enrollment confirmed by	February 1

Regular Decision

Application Deadlines	January 15
Interview Date	January 29
Notified by	No later than April 1
Enrollment confirmed by	May 1

Regular Decision 2

Application Deadlines	April 8
Interview Date	April 23
Notified by	No later than May 2, 2022
Enrollment confirmed by	May 9

AiCE Admission

Required Application Materials

- <u>Common Application</u>
- Application fee
- Official High School Transcript
- SAT/ACT Score (Optional) CMKL University SAT CEEB Code is 7791.
- Computer Science Proficiency (Optional):
  - CS50 Certificate or
  - AP Computer Science or IB/A-Level equivalent or
  - Hackerrank test
  - CMKL Intro Programming
- English Proficiency Requirement:
  - TOEFL iBT > 102 (University ETS code is C532) or
  - IELTS > 7.5 or
  - Duolingo English Test (DET) > 105 (Recommended)
- Statement of Purpose
- Two Recommendation Letters

AiCE Club

Up to date with our CMKL innovations and projects.
Be the first to know about our upcoming events and activities.
Join special talks, events and workshops.
Get to talk & learn exclusively with our staff and engineers!
Be in touch and network with the experts in the field along with professors from world's top universities

Join AiCE Club

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#AiCE Club

CMKL Software Engineer

Q&A - AiCE Admissions

CMKL News

 # AiCE Club

Graggle Today at 9:18 AM
I've got Google internship info. Who want it?

Cap Today at 9:19 AM
I need them too!

Peppe Today at 9:22 AM
send please

Phibi Today at 9:30 AM
me too!