Bachelor of Engineering Programing Computer Engineering (International Program)
(For Students ID 63xxxxx)

1. **Code and Program Title**

   In Thai หลักสูตรวิศวกรรมศาสตรบัณฑิต สาขาวิชาวิศวกรรมคอมพิวเตอร์ (หลักสูตรนานาชาติ)

   In English Bachelor of Engineering Program in Computer Engineering
   (International Program)

2. **Title of Degree and Field of Study**

   In Thai   Full Title   วิศวกรรมศาสตรบัณฑิต (วิศวกรรมคอมพิวเตอร์)

   Abbreviation   วศ.บ. (วิศวกรรมคอมพิวเตอร์)

   In English   Full Title   Bachelor of Engineering (Computer Engineering)

   Abbreviation   B.Eng. (Computer Engineering)

3. **Major Subject:**

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4. **Career Opportunities after Graduation**

   4.1 Computer engineers

   4.2 Software engineers

   4.3 Data engineers and knowledge engineers

   4.4 System analyst

   4.5 System and network administrator

   4.6 IT consultants and system audits in various fields

   4.7 Faculty position, teaching, or teaching assistant in the field of computing for academic institutions and international schools

   4.8 Business owner, Entrepreneur in a cooperate or startup company

5. **Total Credits Required**

   No less than 170 credits

6. Program Structure

1)	Foundation Courses	None	credits
2)	General Education Courses	38	credits
	1. English Communication	12-16	credits
	2. Life Appreciation	4	credits
	3. Global Citizenship	4	credits
	4. Critical Thinking	4	credits
	5. Leadership	4	credits
	6. Digital Literacy	4	credits
	7. GE Electives	2-6	credits
3)	Major Courses	104	credits
	1. Engineering Core Courses	38	credits
	2. Major Required Courses	58	credits
	3. Major Elective Courses	8	credits
4)	I-Design Electives	20	credits
5)	Free Electives	8	credits

Mahidol University
International College

Foundation Courses **Non-credit**

Note I: For B.B.A. students, students whose Mathematics placement is below ICMB 200 Business Mathematics are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICMB 200 Business Mathematics.

For B.Sc. and B.Eng. students, students whose Mathematics placement is below ICMA 106 Calculus I and/or ICMA 151 Statistics for Science I are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICMA 106 Calculus I and/or ICMA 151 Statistics for Science I.

Note II: Based on their achievement on the essay portion of the MUIC entrance exam, students whose English placement is below ICGC 101 Academic Writing and Research I will be placed into the "ERS Track". These students will be required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I.

ICMA 100	Foundation Mathematics	0
ICME 100	English Resource Skills	0

General Education Courses **38 credits**

● **English Communication** **12-16 credits**

Note I: Based on their achievement on the essay portion of the MUIC entrance exam, students will be placed into 3 following tracks: 'ERS Track', 'GC Track' and 'Advanced GC Track'.

- ● 'ERS Track' – Students who are placed into 'ERS Track' will be required to take ICME 100 (a non-credit course) and complete 16 credits in English Communication: ICGC 101, ICGC 102, ICGC 103 in order, and finally, any 200+ level English courses.

- ● 'GC Track' – Students who are placed into 'GC Track' will be required to complete 16 credits in English Communication: ICGC 101, ICGC 102, ICGC 103 in order, and finally, any 200+ level English courses.

- ● 'Advanced GC Track' – Students who are placed into 'Advanced GC Track' will be required to complete 12 credits in English Communication: ICGC 111, ICGC 112 in order, and finally, any 200+ level English courses.

Note II: Students in 'ERS Track' and 'GC Track' must take ICGC 101, ICGC 102 and ICGC 103 without interruption beginning in their first trimester of enrollment.

ICGC 101	Academic Writing and Research I	4
ICGC 102	Academic Writing and Research II	4
ICGC 103	Public Speaking	4
ICGC 111	Academic Writing and Research I (Advanced)	4
ICGC 112	Academic Writing and Research II (Advanced)	4
ICGC 201	Global Realities	4
ICGC 202	Literary Analysis	4
ICGC 203	Creative Writing	4
ICGC 204	Advanced Oral Communication	4
ICGC 206	Literature Into Film	4
ICGC 208	Language and Culture	4
ICGC 210	First and Second Language Acquisition	4
ICGC 211	Topics in Comparative Literature A: Poetry	4
ICGC 212	Topics in Comparative Literature B: The Short Story and the Novel	4
ICGC 213	Topics in Comparative Literature C: Drama	4
ICGC 214	Literary Non-fiction	4
ICGC 215	Writing for Research	4

- **Life Appreciation**   4 credits

ICGH 113	Moving Pictures: A History of Film	4
ICGH 117	Drawing as Creative Expression	4
ICGH 118	Photography Visualizing in the Digital Age	4
ICGH 119	Listen! Soundscapes, Well-Being and Musical Soul Searching	4
ICGN 105	Ecology, Ecosystems and Socio-Economics in Southeast Asia	4
ICGN 108	Essentials of Culinary Science for Food Business	4
ICGN 109	Food for Health	4
ICGN 110	Maker Workshop	4
ICGN 112	Stargazer	4
ICGN 113	Plants, People and Poisons	4
ICGN 115	Human Evolution, Diversity and Health	4
ICGN 120	Chemistry of Cosmetics and Dietary Supplements	4
ICGN 124	Climate Change and Human Society	4
ICGN 125	Games and Learning	2

ICGP 101	American Flag Football	1
ICGP 102	Badminton	1
ICGP 103	Basketball	1
ICGP 104	Body Fitness	1
ICGP 105	Cycling	1
ICGP 106	Discover Dance	1
ICGP 107	Golf	1
ICGP 108	Mind and Body	1
ICGP 109	Selected Topics in Sports	1
ICGP 110	Self Defense (Striking)	1
ICGP 111	Self Defense (Grappling)	1
ICGP 112	Soccer	1
ICGP 113	Social Dance	1
ICGP 114	Swimming	1
ICGP 115	Tennis	1
ICGP 116	Volleyball	1
ICGS 102	Business Sustainability and the Global Climate Change	4
ICGS 115	Sociology in the Modern World	4
ICGS 125	American History, Popular Media and Modern Life	4
ICGS 126	Introduction to Psychology	4
ICGS 127	Positive Psychology	4
ICGS 128	Global Gastronomy and Cuisines	4
ICGS 129	Tea Studies	2
ICLL 100	Self Development	2

- **Global Citizenship**   **4 credits**

ICGH 116	World Cinemas	4
ICGH 120	Thai and ASEAN Cinema	4
ICGH 121	The End of the World? Development and Environment	4
ICGH 122	Introduction to Asian Philosophy	4
ICGH 123	Faiths, Ecological Justice, and the Tropical Rainforests	2
ICGL 101	Elementary German I	4
ICGL 102	Elementary German II	4

ICGL 103	Elementary German III	4
ICGL 111	Elementary Japanese I	4
ICGL 112	Elementary Japanese II	4
ICGL 113	Elementary Japanese III	4
ICGL 121	Elementary French I	4
ICGL 122	Elementary French II	4
ICGL 123	Elementary French III	4
ICGL 131	Elementary Chinese I	4
ICGL 132	Elementary Chinese II	4
ICGL 133	Elementary Chinese III	4
ICGL 141	Elementary Spanish I	4
ICGL 142	Elementary Spanish II	4
ICGL 143	Elementary Spanish III	4
ICGL 160	Introduction to Thai Language and Culture	4
ICGL 161	Elementary Thai I	4
ICGL 162	Elementary Thai II	4
ICGL 163	Elementary Thai III	4
ICGL 170	Diversities in Multilingual Societies	2
ICGL 201	Pre-intermediate German I	4
ICGL 202	Pre-intermediate German II	4
ICGL 203	Pre-intermediate German III	4
ICGL 211	Pre-intermediate Japanese I	4
ICGL 212	Pre-intermediate Japanese II	4
ICGL 213	Pre-intermediate Japanese III	4
ICGL 221	Pre-intermediate French I	4
ICGL 222	Pre-intermediate French II	4
ICGL 223	Pre-intermediate French III	4
ICGL 231	Pre-intermediate Chinese I	4
ICGL 232	Pre-intermediate Chinese II	4
ICGL 233	Pre-intermediate Chinese III	4
ICGL 241	Pre-intermediate Spanish I	4
ICGL 242	Pre-intermediate Spanish II	4
ICGL 243	Pre-intermediate Spanish III	4

ICGN 126	Plant Society	2
ICGS 106	Fashion and Society	4
ICGS 111	Exploring Religions	4
ICGS 112	Geography of Human Activities	4
ICGS 123	Tourism Concepts and Practices	4
ICGS 130	Political Science	4
ICGS 131	Introduction to International Studies	4
ICGS 132	Career Preparation in a Globalized World	4
ICGS 133	Foundation of Mediterranean Cultures	4

- **Critical Thinking**   **4 credits**

ICGH 101	Biotechnology: from Science to Business	4
ICGH 102	Famous Arguments and Thought Experiments in Philosophy	4
ICGH 103	Logic, Analysis and Critical Thinking: Good and Bad Arguments	4
ICGH 105	Technology, Philosophy and Human Kind: Where Are We Now?!	4
ICGH 106	The Greeks: Crucible of Civilization	4
ICGH 107	Contemporary Art and Visual Culture	4
ICGH 109	Creative Thinking Through Art and Design	4
ICGH 110	Drawing as Visual Analysis	4
ICGH 115	Cinematic Languages and Its Application	4
ICGH 124	Life Drawing and Anatomy	4
ICGH 125	How Can We Know What Is Good? Moral Reasoning and Behavior	4
ICGH 126	Behavioral Ethics: Why Good People Do Bad Things	2
ICGN 107	The Chemistry of Everyday Life	4
ICGN 111	Physics for CEO	4
ICGN 123	The Earth's Dynamic Structure	4
ICGN 127	Practical Mathematics	2
ICGS 103	Economics in Modern Business	4
ICGS 113	Perspectives on the Thai Past	4
ICGS 134	Is Democracy Good?	4
ICGS 135	Entrepreneurial Accounting	4

- **Leadership**   **4 credits**

ICGN 114	The Scientific Approach and Society	4
ICGN 128	Climate Emergency, Biodiversity Crisis, and Humanity at Risk	2
ICGS 104	Essentials of Entrepreneurship	4
ICGS 118	Skills in Dealing with People Across Cultures	4
ICGS 121	Abnormal Colleagues: How Do I Make This Work?	4
ICGS 136	Social and Health Issues in Thailand	4
ICGS 137	Witchcraft and Gender Representation	4
ICGS 138	Business Event Essentials	4
ICGS 139	Leadership and Change for a Global Society	4
ICLL 101	Professional Development	2

- **Digital Literacy**   **4 credits**

ICGH 111	Media Literacy: Skills for 21st Century Learning	4
ICGN 116	Understanding and Visualizing Data	4
ICGN 118	Everyday Connectivity	4
ICGN 119	Computer Essentials	4
ICGN 129	Programming for Problem Solving	4
ICGN 130	Cryptography: The Science of Making and Breaking Codes	2
ICGN 131	Digital Search Literacy	2
ICGN 132	Digital Security and Privacy	2
ICGN 133	E-Business: Technology and Digital Strategies	4
ICGN 134	Introduction to Artificial Intelligence	2
ICGS 140	Fake News, Censorship and the Politics of Truth	4
ICLL 102	Skills for a Digital World	2

- **General Education Elective Course**   **2-6 credits**

Students need to take any GE courses to fulfill their 38 credits requirement of General Education: 2 credits for students whose English Communication track are placed into 'ERS track' or 'GC Track' and 6 credits for students whose English Communication track are placed into 'Advanced GC Track'. Partial credits of GE course that exceed the GE requirements cannot be counted towards Free Electives.

Major Courses   **104 credits**

- **Engineering Core Courses**   **38 credits**

ICMA 106	Calculus I	4
ICMA 213	Calculus II	4
ICPY 101	Physics I	4
ICPY 102	Physics II	4
EGCI 113	Fundamental Computer Programming	3
EGCI 201	Discrete Mathematics	4
EGCI 211	Advanced Computer Programming	3
EGCI 230	Electric Circuit Analysis	4
EGCI 232	Engineering Electronics	4
EGCI 305	Statistics for Research in Computer Engineering	4

- **Major Required Courses**   **58 credits**

ICMA 223	Linear Algebra A	2
EGCI 202	Engineering Maths for Signal and System	4
EGCI 213	Programming Paradigms	4
EGCI 221	Data Structures and Algorithms	4
EGCI 231	Digital Circuit Design	4
EGCI 233	Digital Circuit Design Lab	1
EGCI 252	System Programming	4
EGCI 319	Internship In Computer Engineering	2
EGCI 321	Database Systems	4
EGCI 330	Microprocessor and Interfacing	4
EGCI 332	Embedded Systems	4
EGCI 333	Computer Architecture	4
EGCI 340	Software Design	2
EGCI 341	Software Engineering	4
EGCI 351	Operating Systems	4
EGCI 371	Computer Networks and Information Security	4
EGCI 491	Computer Engineering Seminar	1
EGCI 492	Computer Engineering Project	2

- **Computer Engineering Elective Courses**   **8 Credits**

  Note: To earn Specialization in each field, students must complete at least 12 credit from each specialization track.

  - Network and Security Elective Courses

EGCI 432	Distributed Systems	4
EGCI 474	Internetworking Technologies I	4
EGCI 475	Internetworking Technologies II	4
EGCI 476	Cryptography and Computer Security	4
EGCI 477	Penetration Testing and Prevention	4
EGCI 478	Wireless Communication	4

  - System and Signal Elective Courses

EGCI 431	Internet of Things	4
EGCI 451	Cloud Computing	4
EGCI 466	Big Data Processing	4
EGCI 467	Natural Language and Speech Processing	4
EGCI 486	Image Processing	4
EGCI 487	Computer Vision	4

  - Intelligent System and Robotic Sciences Specialization Courses

EGCI 331	Introduction to IC Design	4
EGCI 406	Mechatronics	4
EGCI 407	Human-Robot Interaction (HRI)	4
EGCI 425	Data Mining	4
EGCI 461	Artificial Intelligence	4
EGCI 463	Pattern Recognition	4

  - Linguistic Software and Theory Elective Courses

EGCI 301	Computer Graphics	4
EGCI 404	Theory of Computation	4
EGCI 427	Web Programming	4
EGCI 428	Mobile Device Programming	4
EGCI 429	Web Application Architecture	4

EGCI 494	Fundamental of Digital Forensics	4

- Advanced Topics Courses

EGCI 381	Introduction to Quantum Computing	4
EGCI 382 - 389	Special Topics in Computer Engineering (…)	4
EGCI 394 - 399	Special Topics in Computer Engineering (…)	4

- Field Work Elective Course

EGCI 493	Cooperative Education	8
EGCI 495	Regional Study Experience	1
EGCI 496	International Study Experience	2

I-Design Elective Courses   20 credits

The purpose of the I-Design electives is to promote multidisciplinary learning. Students are encouraged to explore courses offered by diverse disciplines across MUIC, Mahidol University, and partner institutions. The I-Design electives can be satisfied upon the completion of the following course categories:

1. Minor courses offered by any program in MUIC
2. Certificate courses offered by any program in MUIC
3. Any major courses offered by any program in MUIC
4. Any major courses offered in Mahidol University (including undergraduate and graduate level courses). Courses must be approved by the student's advisor and the Curriculum Administrative Committee.
5. Any major courses offered at partner institutions (who have MOU with Mahidol University and/or MUIC). Courses must be approved by the student's advisor and the Curriculum Administrative Committee.

Free Elective Courses   8 credits

Students can take any courses offered by MUIC and/or Mahidol University as free elective courses with the approval from the advisor. A course within the student's major that is too closely related or redundant to core/required/elective courses is discouraged and may be disapproved by an academic advisor.