Bachelor of Science Program in Computer Science (International Program)
(For Students ID 63xxxxx)

1. Code and Program Title

In Thai   หลักสูตรวิทยาศาสตรบัณฑิต สาขาวิชาวิทยาการคอมพิวเตอร์ (หลักสูตรนานาชาติ)

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

2. Title of Degree and Field of Study

In Thai   Full Title   วิทยาศาสตรบัณฑิต (วิทยาการคอมพิวเตอร์)

Abbreviation   วท.บ. (วิทยาการคอมพิวเตอร์)

In English   Full Title   Bachelor of Science (Computer Science)

Abbreviation   B.Sc. (Computer Science)

3. Major Subject:

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4. Career Opportunities after Graduation

1) Software developers/engineers capable of designing, implementing, and deploying solutions from the ground up

2) Data scientists and data platform engineers

3) Owners of IT companies/startups

4) Researchers in the commercial sector and in academia

5) IT consultants and solution engineers in various fields, such as innovative agriculture and smart medicine.

6) Customer relations such as sales, customer service, and support in the IT sector

5. Total Credits Required

No less than 164 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)	Computer Science Major Courses		98	credits
	1.	Core Courses	34	credits
	2.	Required Courses	52	credits
	3.	Elective Courses	12	credits
4)	I-Design Electives		20	credits
5)	Free Electives		8	credits

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   **98 credits**

- **Major Core Courses**   **at least 34 credits**

ICCS 205	Numerical Computation	4
ICCS 206	Discrete Mathematics	4
ICCS 309	Scientific Research and Presentations	4
ICMA 106	Calculus I	4
ICMA 151	Statistics for Science I	4
ICMA 213	Calculus II	4
ICPY 101	Physics I	4
ICPY 102	Physics II	4
ICPY 105	Integrated Laboratory in Physics I	2

- **Major Required Courses**   **at least 52 credits**

Every computer science student has to complete at least 52 credits of required major courses from breadth and capstone categories. The student has to complete all breadth courses to cover core CS knowledge, and finish one of the two capstone options to gain experience working on a sizable research/development project.

Breadth Required Courses

ICCS 101	Introduction to Computer Programming	4
ICCS 121	System Skills and Low-level Programming	4
ICCS 208	Data Structures and Abstractions	4
ICCS 225	Database Foundations	4
ICCS 227	Principles of Computer Systems and Architecture	4
ICCS 261	Principles of Data Science	4
ICCS 271	Interaction Design	4
ICCS 311	Functional and Parallel Programming	4
ICCS 312	Algorithms and Tractability	4
ICCS 370	Software System Construction	4
ICMA 216	Calculus IIIA	2
ICMA 223	Linear Algebra A	2

<u>Capstone Required Courses</u>

Option 1: Senior Project

ICCS 402	Senior Project in Computer Science I	4
ICCS 403	Senior Project in Computer Science II	4

Option 2: Cooperative Education

ICCS 383	Work-Integrated Education (Trimester)	6
ICCS 384	Work-Integrated Education (Summer)	2

● **Major Elective Courses**   **at least 12 credits**

Computer science major elective courses:

ICCS 302	Human Computer Interaction and Visualization	4
ICCS 303	Competitive Programming	4
ICCS 315	Applied Algorithms	4
ICCS 320	Computer Networks	4
ICCS 322	Operating Systems Design and Implementation	4
ICCS 323	IoT Electronics	4
ICCS 324	Computer Architecture	4
ICCS 340	Web Application Development	4
ICCS 361	Data Mining	4
ICCS 371	Scalable Systems	4
ICCS 372	Software Engineering	4
ICCS 404	Computer Graphics and Augmented Reality	4
ICCS 412	Topics in Theory I	4
ICCS 413	Topics in Theory II	4
ICCS 418	Computer System Security	4
ICCS 423	Topics in Systems I	4
ICCS 424	Topics in Systems II	4
ICCS 444	E-Commerce	4
ICCS 448	Mobile Application Programming	4
ICCS 461	Machine Learning	4
ICCS 463	Special Topics in Machine Learning I	4
ICCS 464	Special Topics in Machine Learning II	4

ICCS 471	Topics in Software Technology I	4
ICCS 472	Topics in Software Technology II	4
ICCS 491	Topics in Computer Science I	4
ICCS 492	Topics in Computer Science II	4
ICCS 493	Topics in Computer Science III	4
ICCS 494	Topics in Computer Science IV	4
ICCS 495	Topics in Computer Science V	4
ICMA 214	Ordinary Differential Equations	4
ICMA 217	Calculus IIIB	2
ICMA 224	Linear Algebra B	2
ICMA 322	Advanced Calculus	4
ICMA 346	Optimization	4
ICMA 350	Probability	4
ICMA 424	Abstract Algebra	4
ICPY 492	Electronics	4

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.