

Bachelor of Science Program in Physics (International Program)

1. Code and Program Title

In Thai	หลักสูตรวิทยาศาสตรบัณฑิต สาขาวิชาฟิสิกส์ (หลักสูตรนานาชาติ)
In English	Bachelor of Science Program in Physics (International Program)

2. Title of Degree and Field of Study

In Thai	Full Title	วิทยาศาสตรบัณฑิต (ฟิสิกส์)
	Abbreviation	วท.บ. (ฟิสิกส์)
In English	Full Title	Bachelor of Science (Physics)
	Abbreviation	B.Sc. (Physics)

3. Major Subject (If Applicable) –

4. Career Opportunities after Graduation

- 1) Researcher in international institutes
- 2) Physics instructors
- 3) Financial analysts.
- 4) Start-up Entrepreneurs.
- 5) Consultants at technology based company.

5. Total Credits Required

No less than 176 credits

Note: If students are placed into the 'Advanced Track' for their General Education requirement in English Communication, 4 credits of General Education in English Communication will be waived.

6. Program Structure

1) Foundation Courses	Non-credit
2) General Education Courses	44 credits
- English Communication	16 credits
- Natural Sciences	4 credits
- Humanities and Foreign Languages	12 credits
- Social Sciences	8 credits
- Physical Education	4 credits
3) Major Courses	124 credits
- Core Courses	38 credits
- Major Required Courses	62 credits
- Major Elective Courses	24 credits
4) Free Electives	8 credits

Foundation Courses**0 Credit**

ICME 100	English Resource Skills	0
ICMA 100	Foundation Mathematics	0
ICID100	Freshman Seminar	0

Note:

- Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101
- Students whose Mathematics placement is below ICMA 106 Calculus I are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICMA 106 Calculus.
- All students must take ICID 100 Freshman Seminar, a non-credit course.

General Education Course**44 credits from****English Communication****16 Credits**

EC track (16 credits) : Students are required to take ICGC 101, ICGC 102 and ICGC 103. Once they pass ICGC 103, they must choose one EC IV course (ICGS 2xx) to fulfill their English Communication requirements.

Advanced Track (12 credits): Students are required to take ICGC 111 and ICGC 112. Once they pass ICGC 112, they must choose one EC IV course to fulfill their English Communication requirements. These students will be required to complete only 12 credits in English. 4 credits of General Education in English will be waived.

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) การเขียนเชิงวิชาการและการวิจัย ๑ (ระดับสูง)	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 205	Linguistics	4
ICGC 206	Literature into Film	4
ICGC 207	Diverse English Speaking Cultures	4
ICGC 208	Language and Culture	4
ICGC 209	The Story of English	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

Humanities and Foreign Languages

12 Credits

Students are required to take at least 4 credits from an ICGH course, the other 8 credits can be chosen from any listed ICGH and ICGL courses.

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 104	Moral Reasoning: How can we know what is good?	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 108	Creative Drawing Expression	4
ICGH 109	Creative Thinking Through Art and Design	4
ICGH 110	Drawing as Visual Analysis	4
ICGH 111	Media Literacy: Skills for 21st Century Learning	4
ICGH 112	Photography	4
ICGH 113	Moving Pictures: A History of Film	4
ICGH 114	The Sound of Music: Form, Emotion, and Meaning	4
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
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Natural Sciences

4 Credits

ICGN 101	Decision Mathematics	4
ICGN 105	Ecology, Ecosystems and Socio-Economics in Southeast Asia	4
ICGN 106	Climate Change and Human Society	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 116	Understanding and Visualizing Data	4
ICGN 117	Technology behind E-Business and Digital Strategies	4

Social Sciences

8 Credits

ICGS 101	Accounting for Young Entrepreneurs	4
ICGS 102	Business Sustainability and the Global Climate Change	4
ICGS 103	Economics in Modern Business	4
ICGS 104	Essentials of Entrepreneurship	4
ICGS 105	Personal Financial Management	4
ICGS 106	Fashion and Society	4
ICGS 107	MICE 101	4
ICGS 108	Money Matters	4
ICGS 109	American History, Film and Modern Life	4
ICGS 110	Development and Conflicts	4
ICGS 111	Exploring Religions	4
ICGS 112	Geography of Human Activities	4
ICGS 113	Perspectives on the Thai Past	4
ICGS 114	Power, Money and Behavior of Powerful States	4
ICGS 115	Sociology in the Modern World	4
ICGS 116	Power and Politics	4
ICGS 117	Overcoming Stereotypes, Prejudice and Discrimination	4
ICGS 118	Skills in dealing with people across cultures	4
ICGS 119	World Politics	4
ICGS 120	Global Awareness	4
ICGS 121	Abnormal Colleagues; how do I make this work?	4
ICGS 122	Propaganda, Nudge Theory and Marketing: How to resist?	4

Physical Education**4 Credits**

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

Major Courses in Physics**124 Credits****Core Science Courses****38 Credits**

ICBI 101	Biology	4
ICBI 102	Integrated Laboratory in Biological Sciences I	2
ICBI 103	Biology II	4
ICCH 210	General Chemistry I	4
ICCH 211	General Chemistry II	4
ICCH 224	Integrated Laboratory Techniques in Chemistry I	2
ICMA 106	Calculus 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

Required Major Course**62 Credits**

ICPY 200	Modern Physics	4
ICPY 221	Computer Programming for Physics	4
ICPY 231	Mathematical Methods for Physics IA	2
ICPY 232	Mathematical Methods for Physics IB	2
ICPY 309	Scientific Research and Presentation	4

ICPY 321	Intermediate Mechanics	4
ICPY 322	Electricity and Magnetism	4
ICPY 323	Electrodynamics	4
ICPY 324	Wave and Optics	4
ICPY 334	Numerical Methods in Physics	4
ICPY 342	Integrated Laboratory in Physics II	2
ICPY 343	Integrated Laboratory in Physics III	2
ICPY 361	Quantum Mechanics I	4
ICPY 441	Senior Project in Physics	6
ICPY 451	Analytical Mechanics	4
ICPY 452	Statistical Mechanics	4
ICPY 461	Quantum Mechanics II	4

Major Elective Courses*

24 Credits

ICCS 204	Data Structures and Object-Oriented Programming	4
ICCS 206	Discrete Mathematics	4
ICMA 424	Abstract Algebra	4
ICPY 233	Mathematical Methods for Physics IIA	2
ICPY 234	Mathematical Methods for Physics IIB	2
ICPY 333	Mathematical Methods for Physics III	4
ICPY 355	Special Topics in Physics I	4
ICPY 356	Special Topics in Physics II	4
ICPY 357	Special Topics in Laboratory Physics I	4
ICPY 371	Thermal Physics	4
ICPY 455	Special Topics in Physics III	4
ICPY 456	Special Topics in Physics IV	4
ICPY 457	Special Topics in Laboratory Physics II	4
ICPY 463	Quantum Mechanics III	4
ICPY 471	Atomic and Molecular Physics	4
ICPY 472	Solid State Physics	4
ICPY 473	Nuclear Physics and Particle Physics	4
ICPY 474	Astrophysics	4
ICPY 484	Cosmology	4
ICPY 486	Observational Astronomy	4
ICPY 487	Data Analysis in Astronomy	4
ICPY 488	Special Topics in Astronomy	4
ICPY 490	Computational Physics	4
ICPY 492	Electronics	4

ICPY 496	Biophysics	4
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*Students should take the following elective major courses for:

- Astrophysics track choose at least three of these courses: ICPY 474, ICPY 484, ICPY 486, ICPY 487, ICPY 488
- Computational Physics track, choose: ICCS 204, ICPY 490

Free Elective Course

8 Credits

Physics students can take any courses offered by Mahidol University as a free elective course with approval from the advisor, except for the following:

CGN 102 Essential Mathematics

ICGN 103 Essential Mathematics

ICGN 104 Mathematics and Its Contemporary Applications

ICGN 107 The Chemistry of Everyday Life

ICGN 111 Physics for CEO

ICGN 114 The Scientific Approach and Society

ICGN 118 Everyday Connectivity

ICGN 119 Computer Essentials



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