

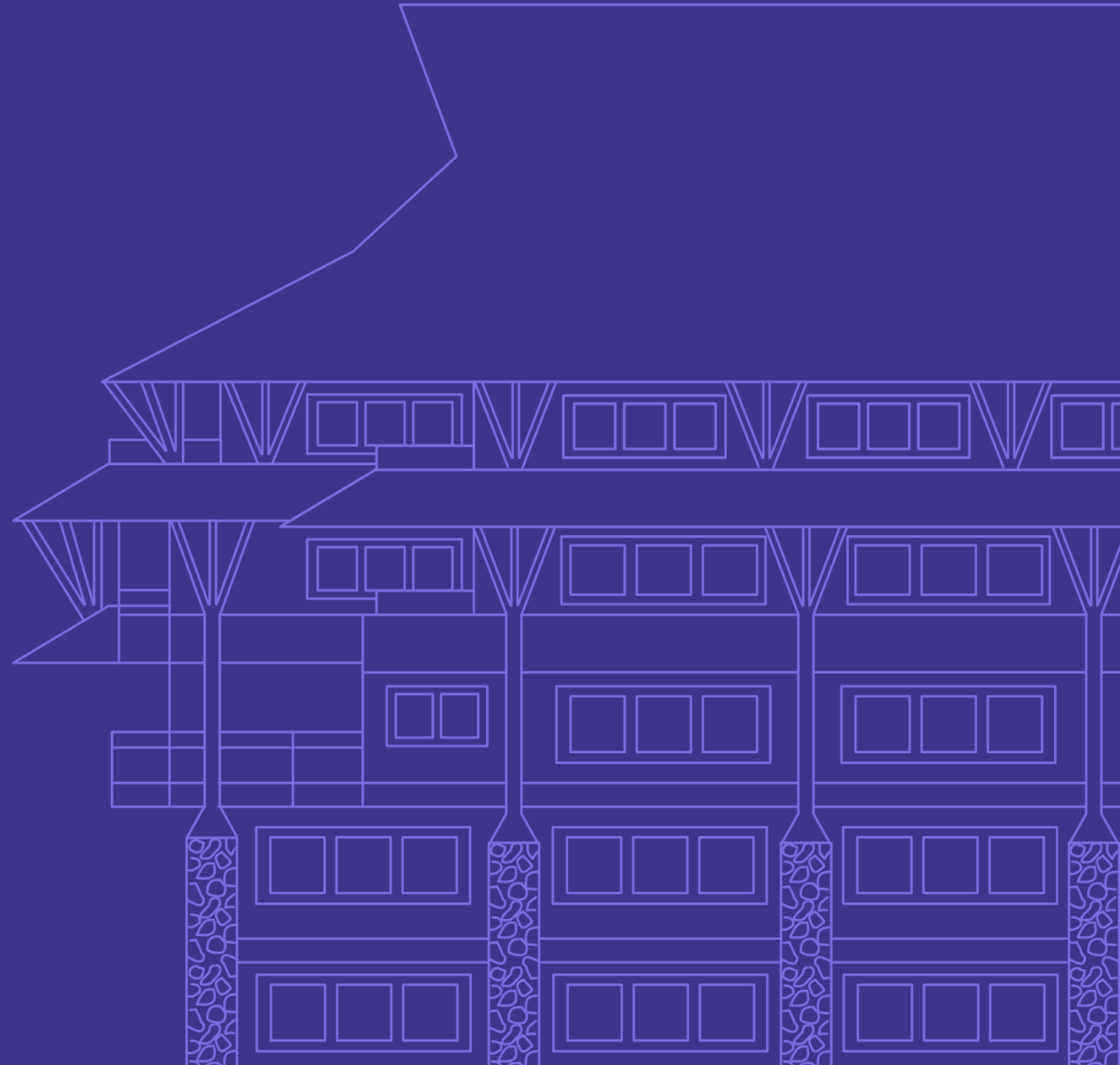
# Preparing future **global** engineer

## Program Overview

**Engineering Physics  
International Undergraduate Program**

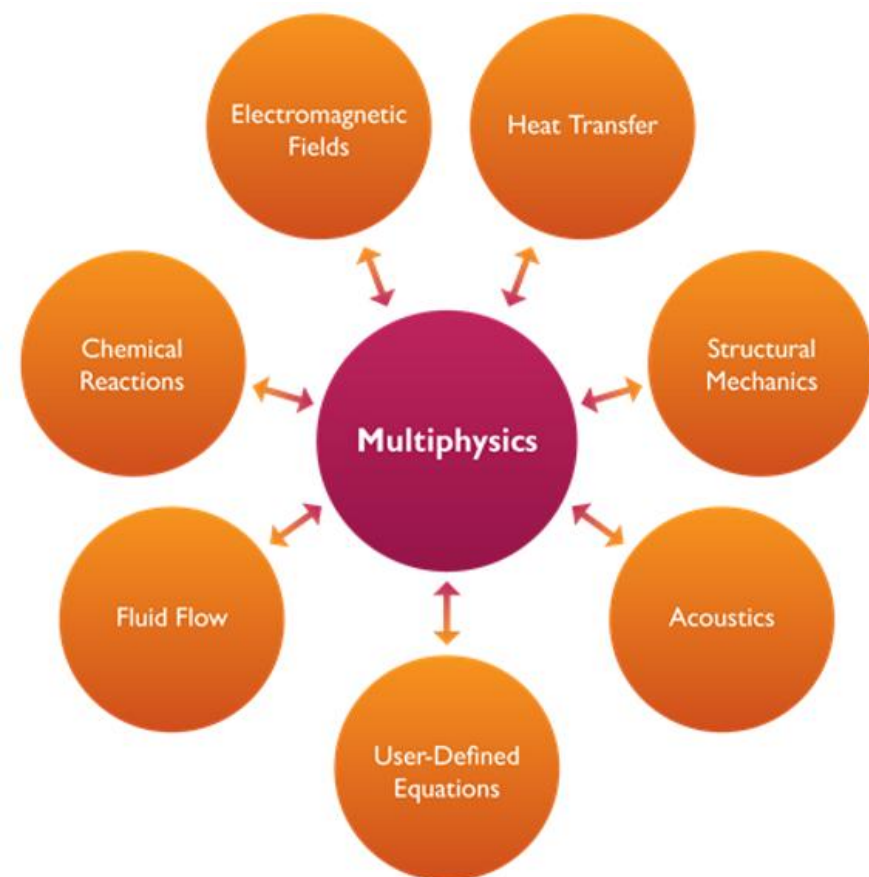
**Faculty of Industrial Technology  
Institut Teknologi Bandung**

*multidiscipline, adaptive, innovative*

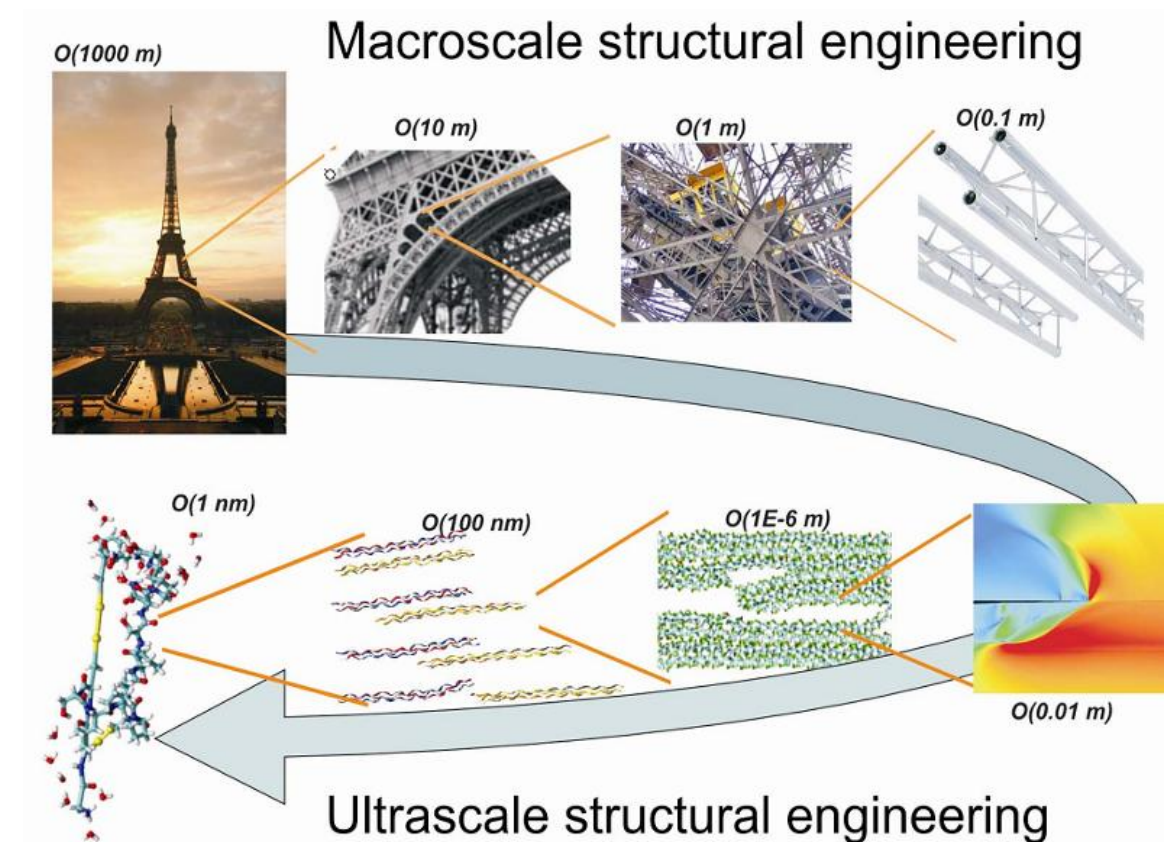
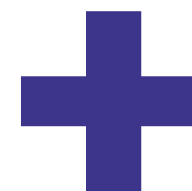


# What is Engineering Physics?

Refers to the study of the combined discipline of **physics, mathematics, chemistry, biology, and engineering** (viz. **computer, nuclear, electrical, electronic, aerospace, materials or mechanical engineering**). By focusing on the scientific method as a rigorous basis, it seeks ways to apply, design, and develop new solutions in engineering.

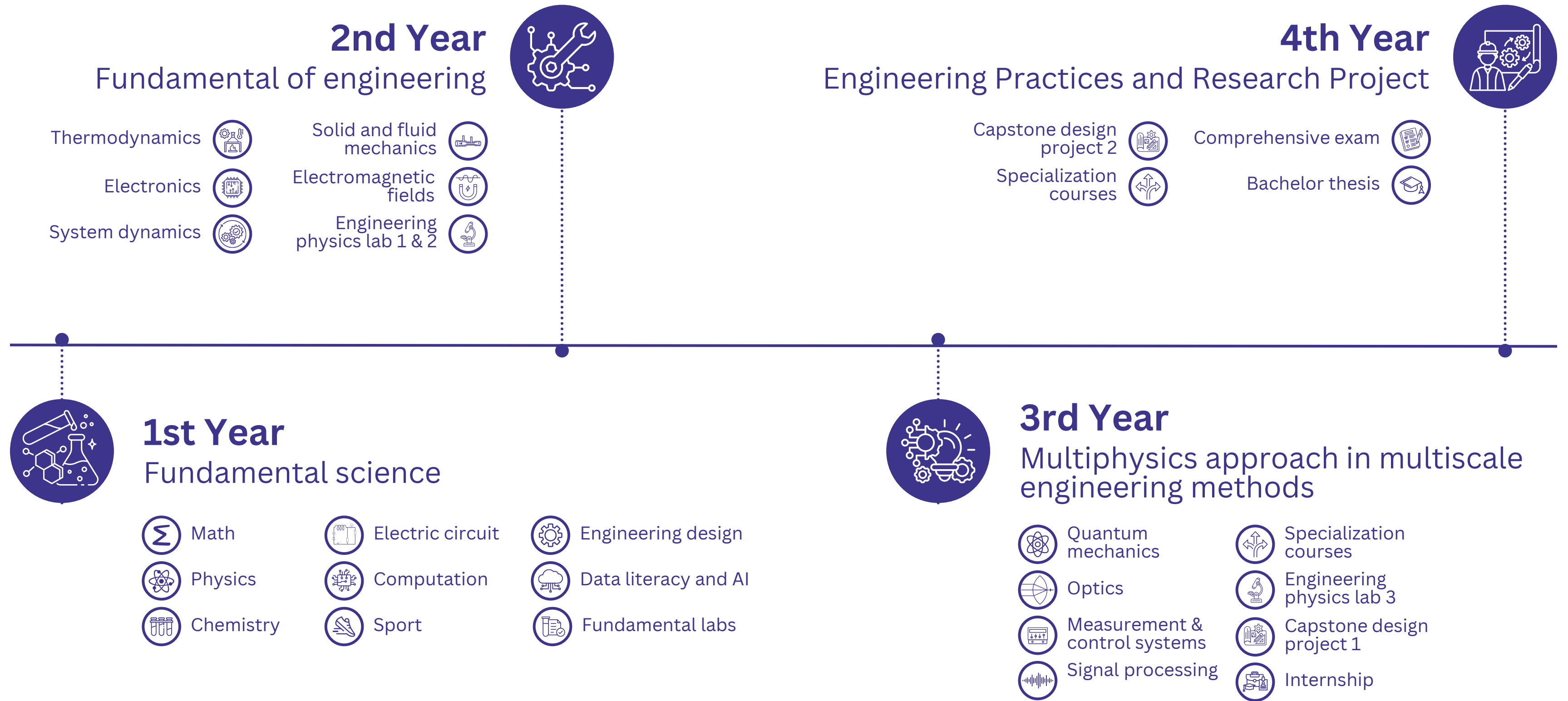


**Multiphysics**



**Multiscale**

# Curriculum



# Curriculum

No	Course name	Credit	No	Course name	Credit
<b>1<sup>st</sup> semester</b>			<b>2<sup>nd</sup> semester</b>		
1	MA1101 Mathematics I	4	1		2
2	FI1101 General Physics I	3	2	TF1203 Introduction to Material Structure and Property	3
3	KI1101 General Chemistry I	3	3	WI2001 Introduction to Engineering and Design	2
4	WI1101 Pancasila	2	4	WI2002 Artificial Intelligence and Data Literacy	3
5	WI1102 Computational Thinking	2	5	WI2003 Sports	2
6	WI1103 Introduction to Principles of Sustainability	2	6	WI2005 Indonesian Language	1
7	WI1111 Basic Physics Laboratory	1	7	MA2021 Matrices and Vector Spaces	2
8	WI1112 Basic Chemistry Laboratory	1	8		3
<b>3<sup>rd</sup> semester</b>			<b>4<sup>th</sup> semester</b>		
1	TF2101 Physical Mathematics I	3	1	TF2201 Physical Mathematics II	3
2	TF2102 Probability and Statistics	3	2	TF2202 System Dynamics	3
3	TF2103 Engineering Computation	3	3	TF2203 Engineering Data Science	3
4	TF2104 Thermal Engineering	3	4	TF2204 Continuum Mechanics	3
5	TF2105 Analog and Digital Electronics	3	5	TF2205 Electromagnetics	3
6	TF2106 Introduction to EngineeringBiology	2	6	TF2206 Energy Conversion	3
7	TF2107 Engineering Physics Laboratory I	2	7	TF2207 Engineering Physics Laboratory II	2

# Curriculum

No	Course name	Credit	No	Course name	Credit
<b>5<sup>th</sup> semester</b>			<b>6<sup>th</sup> semester</b>		
1	TF3101 Automatic Control	3	1	TF3001 Capstone Design Project I	3
2	TF3102 Quantum Mechanics	3	2	TF3002 Professional Ethics	2
3	TF3103 Optical Engineering	3	3	TF3003 Capita Selecta of Engineering Physics	2
4	TF3104 Measurement Systems	3	4	WI2004 English	2
5	TF3105 Signal Processing	3			
6	TF3106 Engineering Physics Laboratory III	2			
7	WI2022 Project Management	2			
<b>7<sup>th</sup> semester</b>			<b>8<sup>th</sup> semester</b>		
1	TF4001 Capstone Design Project II	3	1	TF4090 Final Project	3
2	TF4002 Industrial Internship	3			
3	WI201X Religion	2			
4	WI2006 Civic Education	2			

## Specialization



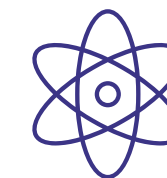
**Bio and Medical  
Instrumentation System  
Engineering**



**Energy System Engineering**



**Instrumentation and Control  
Engineering**



**Nano Technology and  
Material Engineering**

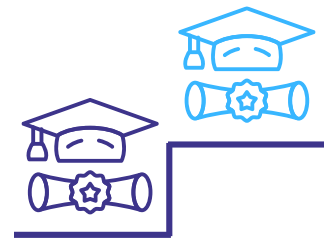


**Sustainable Building and  
Environment Engineering**

# Learning Outcome

1. Able to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. Able to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. Able to communicate effectively with a range of audiences
4. Able to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. Able to function effectively on a team whose members together provide leadership, create a collaborative and Inclusive environment, establish goals, plan tasks, and meet objectives
6. Able to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. Able to acquire and apply new knowledge as needed, using appropriate learning strategies

# Partnership program



## 3+1 Program with bachelor degree from ITB and master degree from partner university #

- School of Engineering, Tohoku University (Japan)
- Faculty of Engineering, Kyushu University (Japan)
- Faculty of Engineering, The University of Queensland (Australia)\*\*
- Dept. of Applied Physics, University of Groningen (Netherlands)
- Dept. of Mechanical Engineering, Universiti Teknologi Malaysia (Malaysia)\*\*
- Dept. Mechanical Engineering, Universiti Kebangsaan Malaysia (Malaysia)\*\*
- Dept of Mechanical Engineering & Dept. of Applied Physics, Universiti Teknologi Petronas (Malaysia)



## 2+2 Program with 2 bachelor degrees

Dept. of Applied Physics, The Hongkong Polytechnic University (with minor in Entrepreneurship or Artificial Intelligence)



## Short Course and Student Exchange Program

Various universities, research institutions and companies across America, Europe, and Asia

\*\* potential 1-year direct extension to master degree from partner university (3+1+1)  
# Several universities accept "4 + 0,5" semester as well (mostly research-only program)

## Estimation of education cost

No	University	Program	Estimated education costs* (ITB)	Estimated education costs per annum** (Outbound)
1	Hong Kong Polytechnic University, Hong Kong	<ul style="list-style-type: none"> <li>Bachelor double degree (2+2 program)</li> <li>Short Research / Academic Exchanges</li> </ul>	Rp 270.000.000	HKD 259,000
2	Tohoku University, Japan	<ul style="list-style-type: none"> <li>Bachelor degree (3+1 program or 4+0.5 program, degree from ITB)</li> <li>Short Research / Academic Exchanges</li> </ul>	Rp 389.000.000 - Rp 509.000.000	JPY 1,975,800
3	Universiti Kebangsaan Malaysia, Malaysia	<ul style="list-style-type: none"> <li>Bachelor degree (3+1 program or 4+0.5 program, degree from ITB)</li> <li>3 + 1 + 1 (B.Eng ITB + M.Eng. From UKM)</li> <li>Short Research / Academic Exchanges</li> </ul>	Rp 389.000.000 - Rp 509.000.000	MYR 36,000
4	Universiti Teknologi Malaysia, Malaysia	<ul style="list-style-type: none"> <li>Bachelor degree (3+1 program or 4+0.5 program, degree from ITB)</li> <li>3 + 1 + 1 (B.Eng ITB + M.Eng. From UTM)</li> <li>Short Research / Academic Exchanges</li> </ul>	Rp 389.000.000 - Rp 509.000.000	MYR 37,000
5	Universiti Teknologi Petronas, Malaysia	<ul style="list-style-type: none"> <li>Bachelor degree (3+1 program or 4+0.5 program, degree from ITB)</li> <li>Short Research / Academic Exchanges</li> </ul>	Rp 389.000.000 - Rp 509.000.000	MYR 34,000 - MYR 42,000
6	University of Groningen, Netherlands	<ul style="list-style-type: none"> <li>Bachelor degree (3+1 program or 4+0.5 program, degree from ITB)</li> <li>Short Research / Academic Exchanges</li> </ul>	Rp 389.000.000 - Rp 509.000.000	EUR 35,300
7	The University of Queensland, Australia	<ul style="list-style-type: none"> <li>Short Research / Academic Exchanges</li> <li>3+2 leading to Master Course</li> </ul>	Rp 389.000.000 - Rp 509.000.000	AUD 87,000

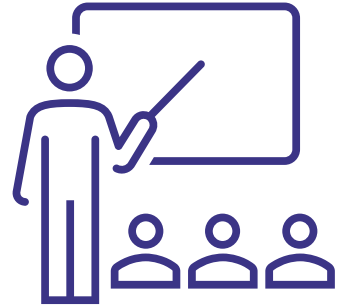
\* Cost estimates may differ due to variations in the Institution Development Donation and living costs.

\*\* Cost estimates may differ due to variations in flight ticket prices, settlement costs, and living costs.

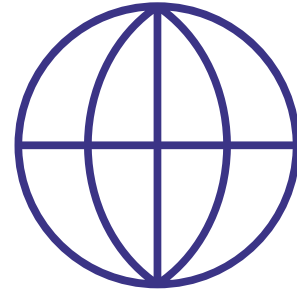
## Career pathways

Industry domains	Typical roles
Instrumentation & Control	Instrument Engineer, Control Systems Engineer, Robotics Engineer
Energy & Sustainability	Renewable Energy Engineer, Energy Systems Analyst, Sustainability Consultant
Advanced Materials & Devices	Materials Engineer, Nanotechnology Engineer, Semiconductor Engineer
Research & Innovation	R&D Engineer, Research Assistant
Business & Consulting	Management Trainee, Technology Consultant

## Why IUP (vs Regular Program)?



**100% English  
taught**



**Structured  
international  
exposure**



**Project &  
research driven**



**Global-ready**



**“Our project was developed through global case studies and international mentoring, and it led us to win an international competition.”**

Through coursework guided by our lecturers and professors, we worked on a recent case inspired by global challenges. We refined our design based on international standards and best practices. This learning experience prepared us to participate in an international student competition, where our team was recognized for its innovation and technical quality.

**Farhan Afdhalul Ihsan, Electrical Engineer at Kubota (Japan), Engineering Physics Alumni, FIT ITB**