



Dual Bachelor's Degree Program

Bachelor of Engineering (Robotics and AI Engineering)

Bachelor of Engineering (Smart Materials Technology)

Faculty of Engineering

College of Nanotechnology

King Mongkut's Institute of Technology Ladkrabang

Dual Bachelor's Degree Program

5. Name of Program's Designated Responsible Administration

Name-Surname (Academic Position)	
1. Vice-Rector for Academic Affair	Chairman
2. Dean of College of Nanotechnology	Committee
3. Dean of Faculty Engineering	Committee
4. Head of Smart Materials Technology Program	Committee
4. Head of Robotics and AI Program	Committee
6. Head, Department of Nanoscience and Nanotechnology	Committee
7. Vice-Rector for Academic Affair, Faculty Engineering	Committee
8. Vice-Rector for Academic Affair, College of Nanotechnology	Committee/Secretary

6. Study Site Location

- King Mongkut's Institute of Technology Ladkrabang (Bangkok)
- King Mongkut's Institute of Technology Ladkrabang (Prince of Chumphon Campus)
- Outside Campus (specify)

7. Required Course for Both Program

Curriculum Structure and Courses

7.1 Curriculum Structure

1 st Degree			2 nd Degree		
General Education	30	Credits	General Education	30	Credits
Special Education	84	Credits	Special Education	93	Credits
Fundamental Subjects	42	Credits	Fundamental Subjects	42	Credits
Elective Mandatory Subjects	21	Credits	Elective Mandatory Subjects	30	Credits
Elective Subjects	15	Credits	Elective Subjects	15	Credits
Alternative Subjects	6	Credits	Alternative Subjects	6	Credits
Elective Subjects	6	Credits	Elective Subjects	6	Credits
Total Credits	120		Total Credits	1	29

Dual's Degree	
General Education	30 Credits
Special Education	144 Credits
Fundamental Subjects	42 Credits
Elective Mandatory Subjects	51 Credits
Elective Subjects	15 Credits
Alternative Subjects	6 Credits
Free Elective Subjects	6 Credits
Total Credits	150

7.2 General Education

The First Degree

- Based on Academic Year 2557
- Based on Academic Year 2559
- Based on others (specify) International Program

The Second Degree

- Based on Academic Year 2557
- Based on Academic Year 2559
- Based on others (specify) International Program

7.3 Required Course for Both Curriculum: Special Education

Code	Subject	Credits
01006801	INTRODUCTION TO ENGINEERING PROGRAMMING	3 (2-2-5)
01006710	INTRODUCTION TO CALCULUS	3 (3-0-6)
01006711	ADVANCED	3 (3-0-6)
01416301	DIFFERENTIAL EQUATIONS AND MATRIX ALGEBRA	3 (3-0-6)
01416307	PHYSICS 1	3 (2-3-8)
01416308	KINEMATICS AND DYNAMICS	3 (3-0-6)
01416309	ENGINEERING 3D DRAWING	3 (2-2-5)
01416204	ENGINEERING MECHANICS FOR RAI	3 (3-0-6)
01416302	MANUFACTURING PROCESS	3 (3-0-6)
01416303	INTRODUCTION TO ROBOTICS	3 (3-0-6)
01416304	FEEDBACK CONTROL 1	3 (3-0-6)
01416305	ARTIFICIAL INTELLIGENCE TECHNOLOGY	3 (3-0-6)
01416306	SAFETY AND STANDARDIZATION IN RAI	3 (3-0-6)
01416312	ELECTRIC CIRCUIT AND ELECTRONICS	3 (3-0-6)
Total credits		42

7.4 Course Equivalence

1 st Degree			2 nd Degree		
Code	Subject	Credits	Code	Subject	Credits
09100800	CAPSTONE DESIGN PREPARATION	6 (3-6-9)	01416800	RAI CAPSTONE DESIGN PREPARATION	6 (3-6-9)
09100801	COOPERATIVE EDUCATION	6 (0-45-0)	01006301	COOPERATIVE EDUCATION	6 (0-45-0)
09100802	STUDY ABROAD	6 (6-0-12)	01006301	STUDY ABROAD	6 (6-0-12)
Total credits		18	Total credits		18

7.5 Required Courses

1 st Degree			2 nd Degree		
Code	Subject	Credits	Code	Subject	Credits
09100500	INTRODUCTION TO NANOTECHNOLOGY	3(3-0-6)	01xxxxxx	RAI ELECTIVE MANDATORY SUBJECTS: TRACK B - AI AND ROBOTS	30
09106507	NANOSENSORS	3(2-2-5)			
09106509	MICRO AND NANOFABRICATION	3(2-2-5)			
09106512	QUANTUM AND NANO ELECTRONIC DEVICES	3(3-0-6)			
09106514	APPLICATIONS AND TRENDS OF NANOMATERIALS	3(3-0-6)			
09106xxx	ELECTIVE MANDATORY SUBJECTS	6			
09106xxx	ELECTIVE SUBJECTS	15			
Total Credits		36	Total Credits		30

7.6 Free Elective Course: All courses are available for both programs

8. Study Plan

1st Year 1st Semester

Code	Subject	Credits (L-E-S)
01006801	INTRODUCTION TO ENGINEERING PROGRAMMING	3 (2-2-5)
01006710	INTRODUCTION TO CALCULUS	3 (3-0-6)
01416307	PHYSICS 1	3 (2-3-8)
010065xx	(GENED) ELECTIVE SUBJECT	3 (3-0-6)
01416309	ENGINEERING 3D DRAWING	3 (2-2-5)
01416000	(ESL) ACADEMIC LISTENING AND SPEAKING	3 (3-0-6)
09106500	INTRODUCTION TO NANOTECHNOLOGY	3 (3-0-6)
Total Credits		21

1st Year: 2nd Semester

Code	Subject	Credits (L-E-S)
01416303	INTRODUCTION TO ROBOTICS	3 (3-0-6)
01416204	ENGINEERING MECHANICS	3 (3-0-6)
01006711	ADVANCED CALCULUS	3 (3-0-6)
01416200	(GENED) PHYSICS FOR RAI Life (Physic 2)	3 (2-3-8)
01416001	(ESL) ACADEMIC READING AND WRITING	3 (3-0-6)
01416514	ROBOTICS LABORATORY I	1 (0-3-6)
09106503	CHEMISTRY	3 (2-2-5)
Total Credits		19

2nd Year: 1st Semester

Code	Subject	Credits (L-E-S)
01413612	ELECTRIC CIRCUIT AND ELECTRONICS	3 (3-0-6)
xxxxxxxx	(GENED) ELECTIVE SUBJECT	3 (3-0-6)
xxxxxxxx	(GENED) ELECTIVE SUBJECT	3 (3-0-6)
01416301	DIFFERENTIAL EQUATIONS AND MATRIX ALGEBRA	3 (3-0-6)
01416304	FEEDBACK CONTROL 1	3 (3-0-6)
01416003	(GENED) INTERPRETATION AND ARGUMENTS	3 (3-0-6)
01416515	ROBOTICS LABORATORY II	1 (0-3-6)
09106507	NANOSENSORS	3 (2-2-5)
Total Credits		22

2nd Year: 2nd Semester

Code	Subject	Credits (L-E-S)
xxxxxxxx	(GENED) ELECTIVE SUBJECT	3 (3-0-6)
01416306	SAFETY AND STANDARDIZATION	3 (3-0-6)
01416203	DISCRETE MATHEMATICS AND APPLICATION	3 (3-0-6)
01416307	KINEMATICS AND DYNAMICS	3 (3-0-6)
01416302	MANUFACTURING PROCESS	3 (3-0-6)
01416516	ROBOTICS LABORATORY III	1 (0-3-6)
09106509	MICRO AND NANO-FABRICATION	3 (2-2-5)

09106xxx	ELECTIVE MANDATORY SUBJECT FOR SMART MATERIALS TECHNOLOGY	3 (x-x-x)
Total Credits		22

3rd Year: 1st Semester

Code	Subject	Credits (L-E-S)
01416202	(GENED) PROBABILITY AND STATISTICS FOR RAI	3 (3-0-6)
01416305	ARTIFICIAL INTELLIGENCE TECHNOLOGY	3 (3-0-6)
01xxxxxx	RAI ELECTIVE MANDATORY SUBJECT	3 (3-0-6)
01xxxxxx	RAI ELECTIVE MANDATORY SUBJECT	3 (3-0-6)
09106512	QUANTUM AND NANOELECTRONIC DEVICES	3 (3-0-6)
09106514	APPLICATIONS AND TRENDS OF NANOMATERIALS	3 (3-0-6)
09106xxx	ELECTIVE SUBJECT FOR SMART MATERIALS TECHNOLOGY	3 (3-0-6)
Total Credits		21

For Regular Student

3rd Year: 2nd Semester

Code	Subject	Credits (L-E-S)
xxxxxxx	(GENED) ELECTIVE SUBJECT	3 (3-0-6)
xxxxxxx	FREE ELECTIVE SUBJECT	3 (x-x-x)
01xxxxx	RAI ELECTIVE MANDATORY SUBJECT	3 (3-0-6)
01xxxxx	RAI ELECTIVE MANDATORY SUBJECT	3 (3-0-6)
01xxxxx	RAI ELECTIVE MANDATORY SUBJECT	3 (3-0-6)
09106xxx	ELECTIVE MANDATORY SUBJECT FOR SMART MATERIALS TECHNOLOGY	3(X-X-X)
Total Credits		18

3rd Year: 3rd Semester (summer)

Code	Subject	Credits (L-E-S)
01006805	INDUSTRIAL INTERNSHIP	0 (0-45-0)
Total Credits		0

4th Year: 1st Semester

Code	Subject	Credits (L-E-S)
xxxxxxx	FREE ELECTIVE SUBJECT	3 (x-x-x)
01xxxxxx	RAI ELECTIVE MANDATORY SUBJECT	3 (3-0-6)
09106xxx	ELECTIVE SUBJECT FOR SMART MATERIALS TECHNOLOGY	3 (3-0-6)
09106800	CAPSTONE DESIGN PREPARATION	6 (3-6-9)
Total Credits		15

4th Year: 2nd Semester

Code	Subject	Credits (L-E-S)
09106402	NANOTECHNOLOGY FOR ENERGY STORAGE	3 (3-0-6)
01xxxxxx	RAI ELECTIVE MANDATORY SUBJECT	3 (3-0-6)
09106xxx	ELECTIVE SUBJECT FOR SMART MATERIALS TECHNOLOGY	3 (3-0-6)
01266512	ROBOTICS AND AI ENGINEERING CAPSTONE DESIGN	3 (2-2-6)
Total Credits		12

FOR CO-OP/STUDY ABROAD STUDENTS

3rd Year: 2nd Semester

Code	Subject	Credits (L-E-S)
xxxxxxx	(GENED) ELECTIVE SUBJECT	3 (3-0-6)
xxxxxxx	FREE ELECTIVE SUBJECT	3 (x-x-x)
09106402	NANOTECHNOLOGY FOR ENERGY STORAGE	3 (3-0-6)
09106xxx	ELECTIVE SUBJECT FOR SMART MATERIALS TECHNOLOGY	3 (3-0-6)
01xxxxxx	RAI ELECTIVE MANDATORY SUBJECT	3 (3-0-6)
01xxxxxx	RAI ELECTIVE MANDATORY SUBJECT	3 (3-0-6)
01xxxxxx	RAI ELECTIVE MANDATORY SUBJECT	3 (3-0-6)
Total Credits		21

3rd Year: 3rd Semester (summer)

Code	Subject	Credits (L-E-S)
01006805	INDUSTRIAL INTERNSHIP	0 (0-45-0)
Total Credits		0

4th Year: 1st Semester

Code	Subject	Credits (L-E-S)
01006301 or 01006302	COOPERATIVE EDUCATION STUDY ABROAD	6 (0-45-0) 6 (6-0-12)
Total Credits		6

4th Year: 2nd Semester

Code	Subject	Credits (L-E-S)
01xxxxxx	RAI ELECTIVE MANDATORY SUBJECT	3 (3-0-6)
01xxxxxx	RAI ELECTIVE MANDATORY SUBJECT	3 (3-0-6)
xxxxxxxx	FREE ELECTIVE SUBJECT	3 (x-x-x)
01266512	ROBOTICS AND AI ENGINEERING CAPSTONE DESIGN	3 (2-2-6)
09106xxx	ELECTIVE SUBJECT FOR SMART MATERIALS TECHNOLOGY	3 (3-0-6)
09106xxx	ELECTIVE MANDATORY SUBJECT FOR SMART MATERIALS TECHNOLOGY	
Total Credits		18

Total Credits required for graduation must be at least 150 credits

ELECTIVE SUBJECTS FOR SMART MATERIALS TECHNOLOGY

Code	Subject	Credits
09106503	CHEMISTRY	3 (2-2-5)
09106504	ADVANCED ELECTRONIC CIRCUITS	3 (3-0-6)
09106505	SEMICONDUCTOR TECHNOLOGY	3 (3-0-6)
09106400	NANOMATERIAL INVESTIGATION	3 (3-0-6)
09106401	NANOPHOTONICS	3 (3-0-6)
09106402	NANOTECHNOLOGY FOR ENERGY STORAGE	(3-0-6)
09106403	LIGHT EMITTING DEVICES AND DISPLAY TECHNOLOGY	3 (3-0-6)
09106404	NANOSTRUCTURE PHOTOVOLTAIC AND SOLAR CELL ENGINEERING	3 (2-2-5)
09106405	LAB-ON-CHIP TECHNOLOGY	3 (2-2-5)
09106406	MICROELECTROMECHANICAL SYSTEM (MEMS)	3 (3-0-6)
09106510	RESEARCH SKILL DEVELOPMENT	3 (3-0-6)
09106513	ELECTRICAL INSTRUMENTS	3 (3-0-6)

ELECTIVE SUBJECTS FOR SMART MATERIALS TECHNOLOGY

Code	Subject	Credits
01416500	COMPUTER VISIONS	3 (3-0-6)
01416503	DESIGNING COMPUTER VISION APPLICATIONS	3 (3-0-6)
01416504	MACHINE LEARNING IN PRACTICE	3 (3-0-6)
01416505	INTERNET OF THINGS AND SMART ROBOTICS and AI SYSTEMS	3 (3-0-6)
01416507	PERCEPTION AND COGNITIVE ROBOTS	3 (2-2-6)
01416508	ROBOTICS AND AI CAPSTONE DESIGN	3 (2-2-6)
01416509	SYSTEM ENGINEERING	3 (3-0-6)
01416510	HUMAN ROBOT INTERACTION	3 (3-0-6)
01416511	MOBILE ROBOTS	3 (2-2-6)
01416512	PLANNING TECHNIQUES IN ROBOTICS	3 (2-2-6)
01416311	INDUSTRIAL ROBOTICS	3 (3-0-6)
01416514	ROBOTICS LABORATORY I	1 (2-3-6)
01416515	ROBOTICS LABORATORY II	1 (2-3-6)
01416516	ROBOTICS LABORATORY III	1 (2-3-6)