

## Program Structure of Curriculum

### Master of Engineering in Electrical and Computer Engineering

#### Plan A Type A1

Master of Engineering in Electrical and Computer Engineering			
Plan A Type A1			
Semester	Required Course	Elective Course	Credits
1.	<b>Master Thesis</b> (8 credits)	-	<b>11 credits</b> (30 ECTS credits)
	<b>Seminar in ECE</b> (3 credits)		
2.	<b>Master Thesis</b> (8 credits)	-	<b>11 credits</b> (30 ECTS credits)
	<b>Industrial Research Methodology</b> (3 credits)		
3.	<b>Master Thesis</b> (12 credits)	-	<b>12 credits</b> (30 ECTS credits)
4.	<b>Master Thesis</b> (12 credits)	-	<b>12 credits</b> (30 ECTS credits)
<b>Total</b>			<b>46 credits</b> (120 ECTS credits)

#### Course outlines

	Thai credit	ECTS credit
Total required credit	46	120
Taught course	6	12
General core course	6	12
Master thesis	40	108

#### Remark

General core courses are mandatory for all students.

## Plan of Study

### Plan A Type A1 (4 semesters)

Course					ECTS credits	KMUTNB Credits	Code
<b>Semester I</b>							
Master Thesis					24	8	090245097
Seminar in Electrical and Computer Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245005
<b>Total of Semester I</b>					<b>30</b>	<b>11</b>	
<b>Semester II</b>							
Master Thesis					24	8	090245097
Industrial Research Methodology	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245001
<b>Total of Semester II</b>					<b>30</b>	<b>11</b>	
<b>Semester III</b>							
Master Thesis					30	12	090245097
<b>Total of Semester III</b>					<b>30</b>	<b>12</b>	
<b>Semester IV</b>							
Master Thesis					30	12	090245097
<b>Total of Semester IV</b>					<b>30</b>	<b>12</b>	
<b>Total</b>					<b>120</b>	<b>46</b>	

### Regular study plan

#### แผน ก แบบ ก1

ภาคการศึกษาที่ 1 ปีที่ 1 Semester 1 Year 1	ภาคการศึกษาที่ 2 ปีที่ 1 Semester 2 Year 1	ภาคการศึกษาที่ 1 ปีที่ 2 Semester 1 Year 2	ภาคการศึกษาที่ 2 ปีที่ 2 Semester 2 Year 2
090245005 3(3-0-6) Seminar in Electrical and Computer Engineering	090245001 3(3-0-6) Industrial research Methodology	090245097 12 Master Thesis	090245097 12 Master Thesis
090245097 8 Master Thesis	090245097 8 Master Thesis		

## Plan A Type A2

Master of Engineering in Electrical and Computer Engineering			
Plan A Type A2			
Semester	Required Course	Elective Course	Credits
1.	<b>Seminar in ECE</b> (3 credits)	<b>4 courses</b> (12 credits)	<b>15 credits</b> (30 ECTS credits)
2.	<b>Industrial Research Methodology</b> (3 credits)	<b>4 courses</b> (12 credits)	<b>15 credits</b> (30 ECTS credits)
3.	<b>Industrial Internship</b> (at least 16 weeks, 4 credits)	-	<b>4 credits</b> (30 ECTS credits)
4.	<b>Master Thesis</b> (12 credits)	-	<b>12 credits</b> (30 ECTS credits)
<b>Total</b>			<b>46 credits</b> (120 ECTS credits)

### Course outlines

	Thai credit	ECTS credit
Total required credit	46	120
Taught course	30	60
General core course	6	12
Elective course	24	48
Industrial internship	4	30
Master thesis	12	30

### Remark

General core courses are mandatory for all students.

Elective courses can be chosen from the list of all elective courses.

## Plan of Study

## Plan A Type A2 (4 semesters)

Course	Lecture hours	Assignment and self-study	Preparation for exam	Total working hours per semester	ECTS credits	KMUTNB Credits	Code
<b>Semester I</b>							
<b>Core Course</b>							
Seminar in Electrical and Computer Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245005
<b>Elective Courses</b>							
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
<b>Total of Semester I</b>					<b>30</b>	<b>15</b>	
<b>Semester II</b>							
<b>Core Course</b>							
Industrial Research Methodology	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245001
<b>Elective Courses</b>							
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
<b>Total of Semester II</b>					<b>30</b>	<b>15</b>	
<b>Semester III</b>							
Industrial Internship					30	4	090245099
<b>Total of Semester III</b>					<b>30</b>	<b>4</b>	
<b>Semester IV</b>							
Master Thesis					30	12	090245098
<b>Total of Semester IV</b>					<b>30</b>	<b>12</b>	
<b>Total</b>					<b>120</b>	<b>46</b>	

## Regular study plan

### แผน ก แบบ ก2

ภาคการศึกษาที่ 1 ปีที่ 1 Semester 1 Year 1	ภาคการศึกษาที่ 2 ปีที่ 1 Semester 2 Year 1	ภาคการศึกษาที่ 1 ปีที่ 2 Semester 1 Year 2	ภาคการศึกษาที่ 2 ปีที่ 2 Semester 2 Year 2
090245005 3(3-0-6) Seminar in Electrical and Computer Engineering	090245001 3(3-0-6) Industrial research Methodology	090245099 4 Industrial Internship	090245098 12 Master Thesis
090245xxx 3(3-0-6) Elective	090245xxx 3(3-0-6) Elective		
090245xxx 3(3-0-6) Elective	090245xxx 3(3-0-6) Elective		
090245xxx 3(3-0-6) Elective	090245xxx 3(3-0-6) Elective		
090245xxx 3(3-0-6) Elective	090245xxx 3(3-0-6) Elective		

## Plan B

Master of Engineering in Electrical and Computer Engineering			
Plan B			
Semester	Required Course	Elective Course	Credits
1.	<b>Seminar in ECE</b> (3 credits)	<b>4 courses</b> (12 credits)	<b>15 credits</b> (30 ECTS credits)
2.	<b>Industrial Research Methodology</b> (3 credits)	<b>4 courses</b> (12 credits)	<b>15 credits</b> (30 ECTS credits)
3.	<b>Industrial Internship</b> (at least 16 weeks, 4 credits)	-	<b>4 credits</b> (30 ECTS credits)
4.	<b>Master Project</b> (6 credits)	<b>2 courses</b> (6 credits)	<b>12 credits</b> (30 ECTS credits)
<b>Total</b>			<b>46 credits</b> (120 ECTS credits)

### Course outlines

	Thai credit	ECTS credit
Total required credit	46	120
Taught course	36	72
General core course	6	12
Elective course	30	60
Industrial internship	4	30
Master project	6	18

### Remark

General core courses are mandatory for all students.

Elective courses can be chosen from the list of all elective courses.

## Plan of Study

### Plan B (4 semesters)

Course	Lecture hours	Assignment and self-study	Preparation for exam	Total working hours per semester	ECTS credits	KMUTNB Credits	Code
<b>Semester I</b>							
<b>Core Course</b>							
Seminar in Electrical and Computer Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245005
<b>Elective Courses</b>							
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
<b>Total of Semester I</b>					<b>30</b>	<b>15</b>	
<b>Semester II</b>							
<b>Core Course</b>							
Industrial Research Methodology	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245001
<b>Elective Courses</b>							
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
<b>Total of Semester II</b>					<b>30</b>	<b>15</b>	
<b>Semester III</b>							
Industrial Internship					30	4	090245099
<b>Total of Semester III</b>					<b>30</b>	<b>4</b>	
<b>Semester IV</b>							
Master Project					18	6	090245096
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
<b>Total of Semester IV</b>					<b>30</b>	<b>12</b>	
<b>Total</b>					<b>120</b>	<b>46</b>	

## Regular study plan

### แผน ข

ภาคการศึกษาที่ 1 ปีที่ 1 Semester 1 Year 1	ภาคการศึกษาที่ 2 ปีที่ 1 Semester 2 Year 1	ภาคการศึกษาที่ 1 ปีที่ 2 Semester 1 Year 2	ภาคการศึกษาที่ 2 ปีที่ 2 Semester 2 Year 2
090245005 3(3-0-6) Seminar in Electrical and Computer Engineering	090245001 3(3-0-6) Industrial research Methodology	090245099 4 Industrial Internship	090245096 6 Master Project
090245xxx 3(3-0-6) Elective	090245xxx 3(3-0-6) Elective		090245xxx 3(3-0-6) Elective
090245xxx 3(3-0-6) Elective	090245xxx 3(3-0-6) Elective		090245xxx 3(3-0-6) Elective
090245xxx 3(3-0-6) Elective	090245xxx 3(3-0-6) Elective		
090245xxx 3(3-0-6) Elective	090245xxx 3(3-0-6) Elective		



### List of Electives Courses

Course	Lecture hours	Assignment and self-study	Preparation for exam	Total working hours per semester	ECTS credits	KMUTNB Credits	Code
Information Theory and Source Coding	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245121
DSP Design Methodologies and Tools	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245125
Multimedia Communications	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245126
VLSI Architecture	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245127
Algorithm Design of Digital Receivers	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245128
Cryptography	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245129
System and Processor Architectures for Mobile Devices	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245130
Estimation and Detection Theory	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245131
Special Problems in Communication Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245132
Software-Defined Radio and Cognitive Radio Network	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245133
Advanced Topics in Communications	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245134
Electromagnetic Field Theory for Smart Sensing Applications	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245135
Microwave Components and Circuit Design	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245136
Communication Protocols	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245137
Broadband Wireless Communication Systems	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245138
Introduction to Radar Technology	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245139
Power System Reliability	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245222
Electrical Transients in Electrical Power Systems	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245223
Battery Storage Systems	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245224
Electric Vehicles	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245226
Selected Topics in Electrical Power Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245227
Asset Management of Electrical Power System	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245229

Course	Lecture hours	Assignment and self-study	Preparation for exam	Total working hours per semester	ECTS credits	KMUTNB Credits	Code
Power System Monitoring, Control and Protection	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245230
Distributed Generation Systems	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245231
Renewable Energies for Electrical Power Generation	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245233
Electric Drive System	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245234
Testing and Condition Diagnostic of High Voltage Equipment	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245235
Electric Power Generation Control and Protection	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245236
Computer Graphics	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245322
Selected Topics in Practical Computer Science	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245323
Network Security	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245331
Machine Vision	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245332
Digital Image Processing	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245334
Embedded Software	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245336
Machine Learning	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245337
High Performance Computing using Graphics Processing Units	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245338
Advanced Computer Architecture	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245339
Principles of Data Mining	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245340
Information Retrieval	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245341
Algorithmic Differentiation	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245342
Parallel Computing	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245343
High Performance Scientific Computing	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245344
Human-Computer Interaction	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245346
Optimization	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245348
Applications of Digital Image Processing	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245349
Efficient Algorithm	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245350
Hardware and System Software Architectures	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245351
Advanced Software Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245352
Database Systems	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245353
Advanced Database Management Systems	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245354

Course	Lecture hours	Assignment and self-study	Preparation for exam	Total working hours per semester	ECTS credits	KMUTNB Credits	Code
Cloud Computing)	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245355
Storage System	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245356
Compiler Design and Optimization	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245357
Bioinformatics	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245358
Advanced Operating System and Distributed System	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245359
Selected Topics in Computer Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245360
Advanced Topics in Computer Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245361
Communication Systems for Smart Grids	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245423
Internet of Things	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245424
Cyber Security for Smart Grids	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245425
Advanced Topics in Smart Grid Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245426
Special Problems in Smart Grid Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245427
Data Management and Analysis	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245428
Modern Power Grid Operation and Control	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245429
Advanced Wireless Communications and Metering Infrastructure	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245430
Design Methodology	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245431