

Course structure of curriculum

Master of Engineering in Electrical and Software System Engineering

Degree awarded: Master of Engineering (M.Eng.) Program duration: two years Language of instruction: English			
Semester	1.	Coursework Core courses and elective courses (total 5 courses)	15 credits (30 ECTS credits)
	2.	Coursework Core courses and elective courses (total 5 courses)	15 credits (30 ECTS credits)
	3.	Industrial internship (at least 18 weeks)	4 credits (30 ECTS credits)
	4.	Master thesis (6 months)	12 credits (30 ECTS credits)
		Total	46 credits (120 ECTS credits)

Course outlines

Taught course	Thai credit	ECTS credit
Total required credit	46	120
Taught course	30	60
General core course	6	10
Specific core course	9	15
Specific elective course	9	15
Free elective course	6	10
Industrial internship	4	60
Masterthesis	12	60

Remark

General core courses are mandatory for all students.

Specific core courses are mandatory for students in each subprograms. Each subprogram offers its own three specific core courses.

Specific elective courses are offered for students to be selected by their interest in their specialized subprograms.

Free elective courses can be any courses offered in the curriculum. They could be specific elective courses in other subprograms.

There are 4 specialized subprograms:

- Communications Engineering (CE)
- Electrical Power and Energy Engineering (EPE)
- Software Systems Engineering (SSE)
- Smart Grids Engineering (SGE)

Regular study plan

Semester 1 Year 1	Semester 2 Year 1	Semester 1 Year 2	Semester 2 Year 2
090245001 Advanced Mathematics in Electrical Engineering	090245002 Industrial research Methodology	090245099 4 Industrial Internship	090245098 12 Master Thesis
Core specific course	Specific Elective Course		
Core specific course	Specific Elective Course		
Core specific course	Specific Elective Course		
Free Elective Course	Free Elective Course		

Course list for each specialized subsubprogram

Remark: Not all elective courses are not always available. The offered elective courses will be announced at the beginning of the academic year.

Course	Lecture hours	Assignment and self-study	Preparation for exam	Total working hours per semester	ECTS credits	KMUTNB Credits	Code
Semester I							
Core Course							
Industrial Research Methodology	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245001
Communications Engineering (CE)							
Microwave Components & Circuit Design	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245100
Communication Protocols	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245101
Mobile Radio Systems	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245102
General Elective / Specific Elective / Other Elective Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Electrical Power and Energy Engineering (EPE)							
High Voltage Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245200
Electrical Power Systems	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245201
Renewable Energies for Electrical Power Generation	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245202
Free elective course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Software Systems Engineering (SSE)							
Efficient Algorithm	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245300
Software Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245301
Embedded Software	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245302
Free elective course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Smart Grids Engineering (SGE)							
Modern Power Grid Analytics and Operations	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245400
Advanced Metering Infrastructure	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245401
Power System Data Managements and Analyses	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245402
Free elective course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
					30	15	

Course	Lecture hours	Assignment and self-study	Preparation for exam	Total working hours per semester	ECTS credits	KMUTNB Credits	Code
Semester II							
Core Course							
Advanced Mathematics in Electrical Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245002
Communications Engineering (CE)							
Specific 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
Free elective course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Electrical Power and Energy Engineering (EPE)							
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
Free elective course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Software Systems Engineering (SSE)							
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
Free elective course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Smart Grids Engineering (SGE)							
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
Free elective course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
					30	15	
Semester III							
Industrial Internship					30	4	090245099
					30	4	
Semester IV							
Master Thesis					30	12	090245098
					30	12	
Total					120	46	

Course	Lecture hours	Assignment and self-study	Preparation for exam	Total working hours per semester	ECTS credits	KMUTNB Credits	Code
List of General Electives of TGGGS/CE/EPE/SSE/SGE as approved by the TGGGS Coordinators:							
Engineering Economics	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090425003
List of Specific Electives of TGGGS/CE as approved by the TGGGS Coordinators:							
Electromagnetic Field Theory	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245120
Information Theory and Source Coding	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245121
Mobile Radio Networks	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245122
Broadband Wireless Communication Systems	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245123
Antenna Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245124
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
List of Specific Electives of TGGGS/CE as approved by the TGGGS Coordinators:							
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
List of Specific Electives of TGGGS/EPE as approved by the TGGGS Coordinators:							
Power Electronics	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245220
Protective Relaying	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245221
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
Switched Reluctance Drives	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245225
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
Electric Drive System	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245228
Asset Management of Electrical Power System	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245229
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
Electrical Machines	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245232

Course	Lecture hours	Assignment and self-study	Preparation for exam	Total working hours per semester	ECTS credits	KMUTNB Credits	Code
List of Specific Electives of TGGGS/SSE as approved by the TGGGS Coordinators:							
Software Architecture	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245320
Software Model Checking	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245321
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
Selected Topics in Software Systems Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245325
Advanced Database Models and Technologies	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245326
Modern Communications	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245327
Software Reliability	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245328
Optimization Methods	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245329
Distributed Systems and Grid Technology	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245330
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
Cloud Computing	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245333
Digital Image Processing	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245334
Advanced Digital Image Processing	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245335
List of Specific Electives of TGGGS/SGE as approved by the TGGGS Coordinators:							
Asset Management and Substation Automation	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245420
Renewable Energies and Electric Vehicle Technology	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245421
Communication Protocols for Smart Grids	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245422
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