Course Structure of Curriculum

Master of Engineering in Electrical and Software Systems 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	12
Specific core course	9	18
Free elective course	15	30
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.

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

There are 4 specialized subprograms:

Communication and Smart System Engineering (CSE)

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
090245004 Design Methodology	090245001 Industrial research Methodology	090245099　　　4 Industrial Internship	090245098　　　12 Master Thesis
Core Specific course	Free Elective Course		
Core Specific course	Free Elective Course		
Core Specific course	Free Elective Course		
Free Elective Course	Free Elective Course		

Course list for each specialized subsubprogram

Remark: Not all elective courses are 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							
Design Methodology	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245004
Communication and Smart System Engineering (CSE)							
Microwave Components and 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
Broadband Wireless Communication Systems	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245103
General Elective/ Specific Elective/ Other Elective/ Other Specific Course *	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Electrical Power and Energy Engineering (EPE)							
Electric Drive System	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245203
Testing and Condition Diagnostic of High Voltage Equipment	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245204
Electric Power Generation Control and Protection	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245205
General Elective/ Specific Elective/ Other Elective/ Other Specific 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
Hardware and System Software Architectures	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245303
Advanced Software Engineering	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245304
General Elective/ Specific Elective/ Other Elective/ Other Specific Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx

Course	Lecture hours	Assignment and self-study	Preparation for exam	Total working hours per semester	ECTS credits	KMUTNB Credits	Code
Smart Grids Engineering (SGE)							
Modern Power Grid Operation and Control	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245403
Advanced Wireless Communications and Metering Infrastructure	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245404
Data Management and Analysis	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245405
General Elective/ Specific Elective/ Other Elective/ Other Specific Course	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Total of Semester I					30	15	

* To ensure the identity of graduates with appropraiate qualification in specific disciplines, registration of elective courses must be approved by lecturers and coordinator of that specific discipline.

Semester II

Core Course

Industrial Research Methodology	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245001

Elective Courses

General Elective/ Specific Elective/ Other Elective/ Other Specific Course *	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
General Elective/ Specific Elective/ Other Elective/ Other Specific Course *	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
General Elective/ Specific Elective/ Other Elective/ Other Specific Course *	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
General Elective/ Specific Elective/ Other Elective/ Other Specific Course *	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245xxx
Total of Semester II					30	15	

* To ensure the identity of graduates with appropraiate qualification in specific disciplines, registration of elective courses must be approved by lecturers and coordinator of that specific discipline.

Semester III

Industrial Internship					30	4	090245099
Total of Semester III					30	4	

Course Structure of M.Eng. in ESSE   Last update: 25 July 2019

Course	Lecture hours	Assignment and self-study	Preparation for exam	Total working hours per semester	ECTS credits	KMUTNB Credits	Code
Semester IV							
Master Thesis					30	12	090245098
Total of Semester IV					**30**	**12**	
Total					120	46	

List of General Electives of TGGS/CSE/EPE/SSE/SGE as approved by the TGGS Coordinators

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 TGGS/CSE as approved by the TGGS Coordinators:							
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
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
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
List of Specific Electives of TGGS/EPE as approved by the TGGS Coordinators:							
Power System Reliability	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245222

Course	Lecture hours	Assignment and self-study	Preparation for exam	Total working hours per semester	ECTS credits	KMUTNB Credits	Code
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
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
List of Specific Electives of TGGS/SSE as approved by the TGGS Coordinators:							
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
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
Big Data Analytics	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245345
Human-Computer Interaction	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245346
Database and Data Warehouse	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245347
Optimization	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245348

Course	Lecture hours	Assignment and self-study	Preparation for exam	Total working hours per semester	ECTS credits	KMUTNB Credits	Code
Applications of Digital Image Processing	3h x 15w	5h x 15w	30	150	6	3(3-0-6)	090245349
List of Specific Electives of TGGS/SGE as approved by the TGGS Coordinators:							
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