Introduction

The program aims to qualify engineers with solid scientific and technical knowledge who are competent in the design, development, and integration of new electrical, electronic and technical IT and information systems, installations and tools. The MSc program is also designed to prepare students to carry out and coordinate research and innovation tasks, participate in the implementation of basic and applied research projects as well as to continue to Ph.D. studies.

Main training areas (120 credits)

Natural science fundamentals Mathematics, Physics, Computer Science, System Theory, specific professional subjects	20-35 credits
Electrical engineering professional knowledge Solid academic knowledge of the development, design, implementation, production and quality assurance of electrical, electronic and IT tools, installments, and complex systems thus creating complex services	15-35 credits
Mandatory professional core material elective subjects Taking elective specializations into account, one of the professional fields of electrical engineering focusing on the special knowledge of material, tool, appliance, installment, system, technological and design fields. Specific professional fields: embedded information systems, infocommunication systems, control systems, and robot informatics, microelectronics and electronic technology, computer-based systems, multimedia systems and services, electrical engineering systems, process automation and informatics, telecommunication and industrial communication, Thesis work (30 credits)	40-60 credits
Human and economic science Management and Business Economics, Quality assurance, Ergonomics, Communication Theory, Cultural history of Technical Sciences, Environment protection;	10-20 credits
Free Elective subjects	min. 6credits

The orientation of the program is balanced (the rate of theoretic and practical knowledge transfer is 40-60%)

Recommended Curriculum

During MSc studies, students are both on a main and secondary specialization. The study plan with the different specialization combinations is included in the Annex.

Preliminary Course Schedule

According to Faculty regulations:

- The subject datasheet of some specialization subjects may include preliminary subject prerequisites. (Especially in the case of laboratories that are followed by and based on the knowledge of specialization subjects.)
- Project Laboratory 1., Project Laboratory 2., Diploma Thesis Design 1., Diploma Thesis Design 2.
    - Only MSc students of the given program can be admitted
    - The subjects can only be taken one after the other having completed the credits of the previous subject
- The prerequisite of the admission of Diploma Thesis Design 2
    - Completing 84 credits according to the study plan
    - Completing the following subjects
        - 2 Advanced mathematic subjects
          (according to the main specialization of the student)
        - One of the Common Subjects
          (Communication theory BMEVIHVMA07 or Measurement theory BMEVIMIMA17 or Alternating current systems BMVIVEMA13)
        - Natural Science subject
          (Electromagnetic Fields BMEVIHVMA08 or Photonics Devices BMEVIETMA06 or Electrical Insulations and Discharges BMEVIVEMA14)
        - Diploma Thesis Design 1. subject (BMEVI**MT02)
- Further prerequisites may be included in the "Regulations of BME VIK MSc Project Work, final examination and certificate".

Specialization, changing specialization

Students are requested to hand in their application for specialization (the order of their main and secondary specialization) before admittance, during their entrance exam.

Students may submit a request in Neptun Study Administration System in order to change their specialization within the first semester of specialization. In case the request is accepted the student is transferred to the other specialization in the next semester (provided that the specialization starts in the given semester).

Mandatory human and economic science elective subjects

The Human and Economic Science subject block in Electrical Engineering MSc Program consists of 2 parts:

- Engineering management BMEVITMMB03
- Three other subjects (6 credits altogether). The list of Human and Economic Science Elective subjects is available on the Faculty's website

Project subjects

Within the frames of specialization, students take so-called Project Subjects which are related to their selected main and secondary specialization. These subjects normally begin with Project Laboratory 1 in the 1st semester, Project Laboratory 2 in the 2nd semester, followed by Thesis work 1 in the 3rd semester and finally Thesis work 2 in the 4th semester. During classes, students solve more challenging technical problems (projects) either in groups or individually. A topic may cover different fields of science (in which the subtasks are specifically designed for each subject). Students can only take Project Subjects after being enrolled in one of the specializations.

Free elective subjects

Students take Free Elective Subjects for a minimum of 6 credits from the list of recommended and available subjects announced by the Faculty in order to widen their knowledge.

The list of Free Elective Subjects may vary from year to year. The updated lists can be found on the Faculty's website.

ANNEX

The completion of certain subjects of a subject block is determined by certain specializations. The following subject blocks are:

1. Advanced mathematics subjects

There are 2 Advanced mathematics subjects in Electrical Engineering MSc program out of 3 that must be completed within the field of Fundamentals of Science. Each of the three subjects characterizes the professional program of the specialization. Students must take 2 Advanced mathematics subjects according to the chart below:

	Advanced mathematics 1 (fall semester)	Advanced mathematics 2 (spring semester)
Embedded Systems	Stochastics BMETE90MX55	Linear algebra BMETE90MX54
Multimedia Systems and Service	Stochastics BMETE90MX55	Combinatorial optimization BMEVISZMA06
Electric Power Systems	Stochastics BMETE90MX55	Combinatorial optimization BMEVISZMA06

2. Advanced physic subject

Students can select from 2 subjects within the field of Advanced physics, but only one of them needs to be completed. In case of interest, they may take the other subject as a mandatory elective or free elective subject. According to the study plan, the two subjects start in different semesters, which means that Electromagnetic Field starts in the fall semester while Physics 3 in the spring semester.

Electromagnetic Fields	BMEVIHVMA08	fall semester
Physics 3	BMETE11MX33	spring semester

3. Natural Science subject

Students need to complete one of the subjects of the list within the field of Scientific fundamentals. If a student has already completed the Electromagnetic Fields as an Advanced physic subject, then he/she cannot take it once again as Natural science subject.

Electromagnetic Fields	BMEVIHVMA08
Photonics Devices	BMEVIETMA06
Electrical Insulations and Discharges	BMEVIVEMA14

4. Common Subjects

Within the frames of scientific fundamentals, there are three common subjects in the Electrical Engineering MSc program. You can find the common subjects below

Communication theory	BMEVIHVMA07
Measurement theory	BMEVIMIMA17
Alternating current systems	BMVIVEMA13

One of each subject below is related to one of the specializations which students must take as each of them is a substantial part of the professional program of the specializations. The Mandatory common subjects are presented in the chart below. Students may select the other subject from the list

Main specialization	Mandatory Common subject
Embedded Systems	Measurement theory
Multimedia Systems and Service	Communication theory
Electric Power Systems	Alternating current systems

MSc Electrical Engineering Curriculum

There are two versions of the curriculum so that students can begin their studies either in the spring or fall semesters. Subjects – with few exceptions – are only announced once a year, either in the spring or in the fall.

Starts: spring semester

Credits	Course code	Course name	Contact hours L	S	Lab	Requirement
1st semester (spring)						
3		Advanced mathematics 2	2	1		mid-semester mark
4		Common subject	3			mid-semester mark
4		Main specialization subject 1	2	1		exam
4		Main specialization subject 2	2	1		exam
4		Main specialization subject 3	2	1		exam
4		Secondary specialization subject 1	2	1		exam
5	BMEVI**ML02	Project laboratory 1			5	mid-semester mark

Credits	Course code	Course name	Contact hours L	S	Lab	Requirement
2nd semester (fall)						
3		Advanced mathematics 1	2	1		mid-semester mark
4		Natural science elective	4			mid-semester mark
4		Main specialization subject 4	2	1		exam
4		Main specialization subject 5	2	1		exam
4		Main specialization laboratory 1			3	mid-semester mark
4		Secondary specialization subject 2	2	1		exam
4		Secondary specialization subject 3	2	1		exam
5	BMEVI**ML03	Project laboratory 2			5	mid-semester mark pre-requisite: Project laboratory 1

Credits	Course code	Course name	Contact hours L	S	Lab	Requirement
3rd semester (spring)						
4	BMETE11MX33	Physics 3	2	1		exam
4		Common subject	3			mid-semester mark
4		Main specialization laboratory 2			3	mid-semester mark
2		Secondary specialization laboratory			2	mid-semester mark
4	BMEVITMMB03	Engineering management	4			exam
2	BMEGT*****	Mandatory human & economic science elective	2			mid-semester mark
10	BMEVI**MT02	Diploma Thesis Design 1			5	mid-semester mark pre-requisite: Project laboratory 2

Credits	Course code	Course name	Contact hours L	S	Lab	Requirement
4th semester (fall)						
2	BMEVI*****	Free elective	2			mid-semester mark
2	BMEVI*****	Free elective	2			mid-semester mark
2	BMEVI*****	Free elective	2			mid-semester mark
2	BMEGT*****	Mandatory human & economic science elective	2			mid-semester mark
2	BMEGT*****	Mandatory human & economic science elective	2			mid-semester mark
20	BMEVI**MT03	Diploma Thesis Design 2			10	mid-semester mark pre-requisite: Diploma Thesis Design1

Starts: fall semester

		1st semester (fall)			
Credits	**Course code**	**Course name**	**Contact hours**		**Requirement**
			L	**S**	**Lab**	
3		Advanced mathematics 1	2	1		mid-semester mark
4		Natural science elective	4			mid-semester mark
4	BMEVIHVMA08	Electromagnetic Fields	3	1		exam
4	BMEVITMMB03	Engineering management	4			exam
2	BMEGT*****	Mandatory human & economic science elective	2			mid-semester mark
2	BMEGT*****	Mandatory human & economic science elective	2			mid-semester mark
2	BMEVI*****	Free elective	2			mid-semester mark
2	BMEVI*****	Free elective	2			mid-semester mark
5	BMEVI**ML02	Project laboratory 1			5	mid-semester mark

		2nd semester (spring)			
Credits	**Course code**	**Course name**	**Contact hours**		**Requirement**
			L	**S**	**Lab**	
3		Advanced mathematics 2	2	1		mid-semester mark
4		Common subject	3			mid-semester mark
4		Main specialization subject 1	2	1		exam
4		Main specialization subject 2	2	1		exam
4		Main specialization subject 3	2	1		exam
4		Secondary specialization subject 1	2	1		exam
2	BMEVI*****	Free elective	2			mid-semester mark
5	BMEVI**ML03	Project laboratory 2			5	mid-semester mark pre-requisite: Project laboratory 1

		3rd semester (fall)			
Credits	**Course code**	**Course name**	**Contact hours**		**Requirement**
			L	**S**	**Lab**	
4		Main specialization subject 4	2	1		exam
4		Main specialization subject 5	2	1		exam
4		Main specialization laboratory 1			3	mid-semester mark
4		Secondary specialization subject 2	2	1		exam
4		Secondary specialization subject 3	2	1		exam
2	BMEGT*****	Mandatory human & economic science elective	2			mid-semester mark
10	BMEVI**MT02	Diploma Thesis Design 1			5	mid-semester mark pre-requisite: Project laboratory 2

		4th semester (spring)			
Credits	**Course code**	**Course name**	**Contact hours**		**Requirement**
			L	**S**	**Lab**	
4		Common subject	3			mid-semester mark
4		Main specialization laboratory 2			3	mid-semester mark
2		Secondary specialization laboratory			2	mid-semester mark
20	BMEVI**MT03	Diploma Thesis Design 2			10	mid-semester mark pre-requisite: Diploma Thesis Design 1

Main Specialization Subjects

	Embedded Systems	Multimedia Systems and Service	Electric Power Systems
Main specialization subject 1	Artifical Intelligence Based Control BMEVIIIMA09	Mobile and wireless networks BMEVIHIMA07	Power system operation and control BMEVIVEMA01
Main specialization subject 2	SW technology for embedded systems BMEVIMIMA09	Broadband Wireless Telecommunication and Broadcasting Systems BMEVIHVMA01	Electrical systems of sustainable energetic BMEVIVEMA02
Main specialization subject 3	Computer vision BMEVIIIMA07	Foundations of multimedia technologies BMEVIHIMA08	Power system transients BMEVIVEMA03
Main specialization subject 4	Development of SW applications BMEVIAUMA09	Networked multimedia systems & services BMEVIHIMA09	Protection systems and measurement BMEVIVEMA04
Main specialization subject 5	Design & integration of embedded systems BMEVIMIMA11	Media informatics systems BMEVITMMA08	Electric energy market BMEVIVEMA05
Main specialization laboratory 1	Control Engineering and Image Processing Laboratory BMEVIIIMA11	Laboratory on multimedia systems and services 1 BMEVIHIMA10	Electric Power Systems laboratory 1 BMEVIVEMA06
Main specialization laboratory 2	Applied Computer Systems Laboratory BMEVIAUMB03	Laboratory on multimedia systems and services 2 BMEVIHIMB02	Electric Power Systems laboratory 2 BMEVIVEMB00
Mandatory Common subject	Measurement theory BMEVIMIMA17	Communication theory BMEVIHVMA07	Alternating current systems BMVIVEMA13
Advanced mathematics 1	Stochastics BMETE90MX55	Stochastics BMETE90MX55	Stochastics BMETE90MX55
Advanced mathematics 2	Linear algebra BMETE90MX54	Combinatorial optimization BMEVISZMA06	Combinatorial optimization BMEVISZMA06
Project laboratory 1	BMEVIAUML02 BMEVIIIML02 BMEVIMIML02	BMEVIHIML02 BMEVIHVML02 BMEVITMML02	BMEVIVEML02
Project laboratory 2	BMEVIAUML03 BMEVIIIML03 BMEVIMIML03	BMEVIHIML03 BMEVIHVML03 BMEVITMML03	BMEVIVEML03
Diploma Thesis Design 1	BMEVIAUMT02 BMEVIIIMT02 BMEVIMIMT02	BMEVIHIMT02 BMEVIHVMT02 BMEVITMMT02	BMEVIVEMT02
Diploma Thesis Design 2	BMEVIAUMT03 BMEVIIIMT03 BMEVIMIMT03	BMEVIHIMT03 BMEVIHVMT03 BMEVITMMT03	BMEVIVEMT03

Secondary Specialization Subjects

	Optical Communication	Smart City	Smart Systems Integration
Secondary specialization subject 1	Optical Network Elements BMEVIHVMA05	Sensor networks and applications BMEVITMMA09	Fundamentals of smart systems BMEVIEEMA04
Secondary specialization subject 2	Optical Systems and Applications BMEVIHVMA06	Intelligent Transportation Systems BMEVITMMA10	System level design BMEVIEEMA05
Secondary specialization subject 3	Optical Networking Architectures BMEVITMMA12	Human-machine interface BMEVITMMA11	Circuit environment BMEVIEEMA06
Secondary specialization laboratory	Optical Networks Laboratory BMEVIHVMB03	Smart city laboratory BMEVITMMB04	Smart systems design laboratory BMEVIEEMB00