



Master of Science Degree Program
Electrical Engineering Curriculum

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.

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

Specialization

During MSc studies, students must complete one major and one secondary 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. The main and secondary specializations can be combined as desired.

To complete the main specialization, the student must complete all six specialization subjects (4 theoretical and 2 laboratory subjects). In addition to the main specialization, students must also complete one of the secondary specializations. The secondary specialization includes two theoretical subjects and one lab subject.

Changing Specialization

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 new specialization in the next semester (provided that the specialization starts in the given semester).

Summer Internship

One of the conditions for obtaining the diploma is the completion of a professional internship of at least 4 weeks. The possible dates, locations, content and order of conducting the summer internship are published on the Faculty's website.

Human and Economic Science 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



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Project Subjects

Within the frames of specialization, students take so-called Project Subjects which are related to their selected main or 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.

Advanced Mathematics Subjects

Students are free to choose among mathematics subjects, regardless of the major and secondary specialization admission. Two subjects must be completed.

Neptun ID	Title	Semester
TE90MX78	Advanced Linear Algebra	Spring
VISZMA09	Combinatorial Optimization	Spring
TE90MX80	Advanced Mathematics for Electrical Engineers – Stochastics	fall

Natural Science Subject

Students need to complete one of the subjects on the list within the field of scientific fundamentals.

BMEVIETMA13	Photonics Devices
BMEVIVEMA19	Electrical Insulations and Discharges



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Common Subjects

Students need to complete one of the subjects of the list within the field of common subjects.

BMEVIHVMA18	Communication Theory
BMEVIMIMA23	Measurement Theory

Main Specialization Subject C

Students need to complete one of the subjects on the list within the field of professional subjects.

BMEVIHVMB09	Microwave Remote Sensing
BMEVIVEMB05	Electric Energy Market
BMEVIEEMB03	Nanoelectronics and Nanotechnology
BMEVIMIMB07	Safety Critical Embedded Systems

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Students who do not complete a minimum of 120 credits or do not complete one of the compulsory subjects cannot get an MSc degree. 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.

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Starts: fall semester

0 st semester (fall)				
Credits	Subject Code	Subject Name	Contact Hours L S Lab	Requirement
5		Advanced Mathematics 1	4	exam
5		Natural Science Elective	3 1	exam
5		Main Specialization Subject A2	2 1	exam
2	BMEVI*****	Free Elective	2	mid-semester mark
2	BMEVI*****	Free Elective	2	mid-semester mark
5	BMEVI**ML12	Project Laboratory 1	3	mid-semester mark
2	BMEGT*****	Human & Economic Science	2	mid-semester mark
2	BMEGT*****	Human & Economic Science	2	mid-semester mark
1 st semester (spring)				
Credits	Subject Code	Subject Name	Contact Hours L S Lab	Requirement
5		Advanced Mathematics 2	4	exam
5		Common Subject	3	exam
5		Main Specialization Subject A1	2 1	exam
5		Main Specialization Laboratory A2	3	mid-semester mark
5		Secondary Specialization Subject A	2 1	exam
5	BMEVI**ML13	Project Laboratory 2	3	mid-semester mark prerequisite: Project laboratory 1
2 nd semester (fall)				
Credits	Subject Code	Subject Name	Contact Hours L S Lab	Requirement
5		Main Specialization Laboratory A1	3	mid-semester mark
5		Main Specialization Subject C	2 1	exam
5		Secondary Specialization Subject B	2 1	exam
10	BMEVI**MT12	Diploma Thesis Design 1	3	mid-semester mark prerequisite: Project laboratory 2
2	BMEGT*****	Human & Economic Science	2	mid-semester mark
2	BMEVI*****	Free Elective	2	mid-semester mark
0		Summer Internship		signature
3 rd semester (spring)				
Credits	Subject Code	Subject Name	Contact Hours L S Lab	Requirement
4	BMEVITMMB03	Engineering Management	4	exam
5		Main Specialization Subject B	2 1	exam
4		Secondary Specialization Laboratory A	3	mid-semester mark
20	BMEVI**MT13	Diploma Thesis Design 2	7	mid-semester mark prerequisite: Diploma Thesis Design 1

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Starts: spring semester

1 st semester (spring)				
Credits	Subject Code	Subject Name	Contact Hours L S Lab	Requirement
5		Advanced Mathematics 2	4	exam
5		Common Subject	3	exam
5		Main Specialization Subject A1	2 1	exam
5		Secondary Specialization Subject A	2 1	exam
2	BMEVI*****	Free Elective	2	mid-semester mark
5	BMEVI**ML12	Project Laboratory 1	3	mid-semester mark
2 nd semester (fall)				
Credits	Subject Code	Subject Name	Contact Hours L S Lab	Requirement
5		Advanced Mathematics 1	4	exam
5		Natural Science Elective	3 1	exam
5		Main Specialization Subject A2	2 1	exam
5		Main Specialization Laboratory A1	3	mid-semester mark
5		Secondary Specialization Subject B	2 1	exam
5	BMEVI**ML13	Project Laboratory 2	3	mid-semester mark prerequisite: Project laboratory 1
0		Summer Internship		signature
3 rd semester (spring)				
Credits	Subject Code	Subject Name	Contact Hours L S Lab	Requirement
5		Main Specialization Laboratory A2	3	mid-semester mark
5		Main Specialization Subject B	2 1	exam
5		Main Specialization Subject C	2 1	exam
4		Secondary Specialization Laboratory A	3	mid-semester mark
10	BMEVI**MT12	Diploma Thesis Design 1	3	mid-semester mark prerequisite: Project laboratory 2
4	BMEVITMMB03	Engineering management	4	exam
4 th semester (fall)				
Credits	Subject Code	Subject Name	Contact Hours L S Lab	Requirement
2	BMEVI*****	Free Elective	2	mid-semester mark
2	BMEVI*****	Free Elective	2	mid-semester mark
2	BMEGT*****	Human & Economic Science	2	mid-semester mark
2	BMEGT*****	Human & Economic Science	2	mid-semester mark
2	BMEGT*****	Human & Economic Science	2	mid-semester mark
20	BMEVI**MT13	Diploma Thesis Design 2	7	mid-semester mark prerequisite: Diploma Thesis Design 1



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Main Specialization Subjects

	Intelligent Embedded Systems	Intelligent Network	Power Systems
Main Specialization Subject A1	BMEVIMIMA20 Perception and Signal Processing	BMEVITMMA14 Cloud Services Integration for Intelligent Devices	BMEVIVEMA15 Power Systems Operation and Control
Main Specialization Subject A2	BMEVIMIMA22 Embedded Artificial Intelligence	BMEVIHIMA16 Advanced Mobile and Wireless Networks	BMEVIVEMA17 Protection Systems and Measurement Technology
Main Specialization Subject B	BMEVIMIMB06 Data Processing Applications	BMEVIHIMB04 Network Planning and Operations	BMEVIVEMB04 Power System Transients
Main Specialization Laboratory A1	BMEVIMIMA21 Intelligent Embedded Systems Laboratory	BMEVITMMA24 Cloud Services Laboratory	BMEVIVEMA16 Power Systems Laboratory 1
Main Specialization Laboratory A2	BMEVIMIMB05 Embedded Artificial Intelligence Laboratory	BMEVIHIMB11 Advanced Mobile and Wireless Networks Laboratory	BMEVIVEMB03 Power Systems Laboratory 2
Project laboratory 1	BMEVIMIML12	BMEVIHIML12 or BMEVITMML12	BMEVIVEML12
Project laboratory 2	BMEVIMIML13	BMEVIHIML13 or BMEVITMML13	BMEVIVEML13
Diploma Thesis Design 1	BMEVIMIMT12	BMEVIHIMT12 or BMEVITMMT12	BMEVIVEMT12
Diploma Thesis Design 2	BMEVIMIMT13	BMEVIHIMT13 or BMEVITMMT13	BMEVIVEMT13

Secondary Specialization Subjects

	Quantum Communication	Smart City	Building's Electricity	Robotics
Secondary specialization subject A	BMEVIHIMA24 Quantum Computers and Their Applications	BMEVITMMA15 Smart City Infocommunication Technologies	BMEVIVEMA22 Intelligent Buildings and Lighting Systems	BMEVIHIMA21 Robot Arms and Mobile Robots
Secondary specialization subject B	BMEVIHIMA25 Quantum Communication Networks	BMEVITMMA16 Smart City Services and Applications	BMEVIVEMA23 Computer Aided Design in Building Electricity	BMEVIHIMB06 Artificial Intelligence Based Control
Secondary specialization laboratory A	BMEVIHIMB10 Quantum Informatics Laboratory	BMEVITMMB09 Smart City Laboratory	BMEVIVEMB07 Laboratory of Building Electricity	BMEVIHIMB08 Robotic Systems Laboratory