Introduction

The program aims to qualify computer science engineers with solid engineering skills who are competent in installing and operating technical IT and information infrastructure systems and services, and also in designing and developing data and program systems. This means that graduates are expected to use both software development methods and development tools, involving modeling, simulation, performance, and reliability of systems. Students will be able to do programming in an object-oriented and visual programming environment.

BSc Computer Engineering Curriculum

Students who do not complete a minimum of 210 credits or do not complete one of the compulsory subjects cannot get a BSc degree.

1st semester							
Credits	**Course code**	**Course name**	**Contact hours**			**Requirement**	
			L	**S**	**Lab**		
6	BMETE90AX21	Calculus 1 for Informaticians	4	2		exam	
2	BMETE11AX52	Basics of Physics	1	1		mid-semester mark	
6	BMEVISZAA06	Introduction to the Theory of Computing 1	4	2		exam	
5	BMEVIMIAA03	Digital Design	2	1	1	exam	
7	BMEVIEEAA00	Basics of Programming 1	2	2	2	mid-semester mark	
3	BMEVIETAA00	Fundamentals of Electronics and Electrotechnics	2		1	exam	
4	BMEGT60Z950	English for Electrical Engineering and Informatics		4		mid-semester mark	
0	BMEVIDHAAI1	University Experience 1 (not mandatory)		2		signature	

2nd semester							
Credits	**Course code**	**Course name**	**Contact hours**			**Requirement**	
			L	**S**	**Lab**		
6	BMETE90AX57	Calculus 2 for Informaticians	4	2		exam	
4	BMETE11AX53	Physics i	2	2		exam	
5	BMEVISZAA04	Introduction to the Theory of Computing 2	2	2		exam	
5	BMEVIHIAA03	Computer Architectures	3	1		exam	
6	BMEVIIIAA03	Programming 2	2		2	mid-semester mark	
5	BMEVISZAB08	Theory of Algorithms	2	2		mid-semester mark	
0	BMEVIDHAAI2	University Experience 2 (not mandatory)		2		signature	

3rd semester							
Credits	**Course code**	**Course name**	**Contact hours**			**Requirement**	
			L	**S**	**Lab**		
6	BMEVISZAB04	Probability Theory and Statistics	4	2		exam	
4	BMEVIHIAB04	Coding Technology	3	1		exam	
5	BMEVIMIAB03	Operating Systems	3		1	mid-semester mark	
5	BMEVITMAB04	Databases	2	1	1	exam	
5	BMEVIIIAB00	Programming 3	2		2	mid-semester mark	
5	BMEVIMIAB04	Software Engineering	3		1	exam	

4th semester

Credits	Course code	Course name	Contact hours L S Lab			Requirement
7	BMEVITMAB06	Communication Networks	4		2	exam
5	BMEVIAUAB00	Software Techniques	2		2	exam
4	BMEVIIIAB11	Software Project Laboratory			2	mid-semester mark
5	BMEVIIIAB12	Computer Graphics	3		1	exam
4	BMEGT20A001	Management and Business Economics	4			mid-semester mark
2	BMEGT55A001	Business Law	4			mid-semester mark

5th semester

Credits	Course code	Course name	Contact hours L S Lab			Requirement
5	BMEVIMIAC16	Artificial Intelligence	3		1	exam
5		Study Specialization Subject 1	2	2		exam
5		Study Specialization Subject 2	2	2		exam
5		Study Specialization Subject 3	2	2		exam
5		Professional Subject 1	2		2	mid-semester mark
5		Professional Subject 2	2		2	mid-semester mark

6th semester

Credits	Course code	Course name	Contact hours L S Lab			Requirement
5	BMEVIHIAC07	IT Security	3		1	exam
5		Professional Subject 3	2		2	mid-semester mark
5		Professional Subject 4	2		2	mid-semester mark
3		Specialization Laboratory			2	mid-semester mark
5	MEVI**AL04	Project Laboratory			3	mid-semester mark
4	BMEVI****	Free Elective Subject 1	4			exam
4	BMEGT30A001	Micro- and Macroeconomics	4			exam

7th semester

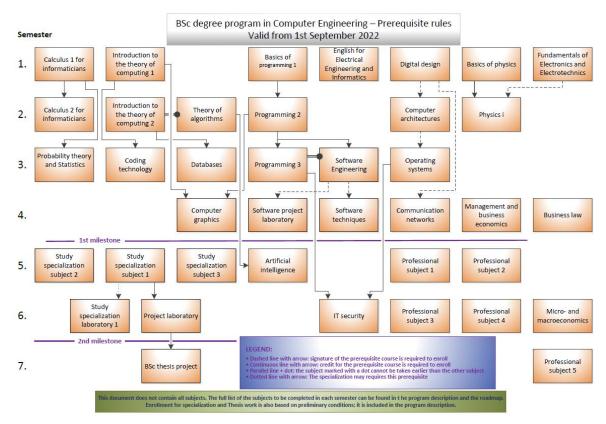| Credits	Course code	Course name	Contact hours L S Lab			Requirement
5		Professional Subject 5	2		2	mid-semester mark
15	BMEVI**AT02	BSc Thesis Project		8		mid-semester mark
2	BMEVI****	Free Elective 2	2			mid-semester mark
2	BMEVI****	Free Elective 2	2			mid-semester mark
2	BMEVI****	Free Elective 2	2			mid-semester mark
2	BMEGT****	Human & Economic Science Elective	2			mid-semester mark

Preliminary Course Schedule

The following diagram shows the structure of the mandatory subjects of the program and the pre-requisites. The subjects without pre-requisites are not presented.

Due to the fixed structure of the subjects of specialization, further preliminary conditions and pre-requisites may be requested in the Neptun Study Administration System.

Pre-requisites of the Professional Subjects are published in the Professional Subjects chapter.

Milestones

- 1st milestone: Specialization enrollment conditions
    - At least 90 credits are completed
    - All courses of the first and second semesters are completed
    - At least 20 credits of the third semester are completed

    The requirements are eased if the student has obtained the signature in both University Experience 1 (BMEVIDHAAI1) and University Experience 2 (BMEVIDHAAI2) subjects. In this case, the student can enter the specialization if he/she fully fulfills two conditions; and only one of the first and second semesters subjects is missing OR a maximum of 6 credits are missing from the third semester. No further permission can be granted, not even based on equity.
- 2nd milestone: Thesis project enrollment conditions
    - at least 174 credits are completed (up to 10 credits free electives)
    - all courses of the first four semesters are completed
    - all specialization courses are completed
    - Project laboratory course is completed

Human and Economic Science

The subject block of human and economic science consists of two parts:

- mandatory subjects
  - English for Electrical Engineering and Informatics (BMEGT60Z950)
  - Management and Business Economics (BMEGT20A001)
  - Micro- and Macroeconomics (BMEGT30A001)
  - Business Law (BMEGT55A001)
- One elective human and economic science subject (min. 2 credits).
  The list of human and economic science elective subjects is available on the Faculty's website.

Mandatory English Language Subjects

The curriculum includes a mandatory language subject in the first semester in order to reinforce effective learning (BMEGT60Z950 English for Electrical Engineering and Informatics).

Students are assigned and registered for courses centrally by the language institute in the first semester. So, it is unnecessary to register in Neptun while deregistration of such courses is not allowed. Please note that this subject can not be substituted based on any language certificates.

Professional Subjects

Students must acquire the credits of 5 compulsory optional professional subjects. These subjects can be selected from a list of 6 items:

Neptun ID	Title	Semester	pre-requisites (credits are required)
VIHIAD00	Quantum Computing and its Applications	spring	VISZAA08 Theory of Algorithms
VIIIAD01	Image Processing	fall	1st milestone (can only be taken after enrollment for specialization)
VITMAD02	Speech Information Systems	spring	VISZAB04 Probability Theory and Statistics
VIAUAD02	Mobile- and Web-based Software	fall	1st milestone (can only be taken after enrollment for specialization)
VIHVAD00	System Theory	fall	TE90AX57 Calculus 2 for Informaticians *AND* VIETAA00 Basics of Electrical and Electronic Systems
VIEEAD00	Technology of IT Devices	spring	VIETAA00 Basics of Electrical and Electronic Systems *AND* VIMIAA03 Digital Design

Some of the subjects are offered in the autumn semester, and another in the spring semester. Their total number of hours and number of credits are the same, but the distribution of practice/laboratory hours may be different. Students must consider that any combination cannot be put together during the 3 semesters.

Specialization

Specializations start every fall semester, and the selection of specialization is always at the end of the 4th semester. At the end of the spring semester (after the end of the exam period), the students who have met all criteria for enrollment to specializations forward their preferred order of specialization to the Faculty. The decision on the type of specialization and the placement of students depends on the number and the results of applying students and the Faculty's teaching capacity.

	Software Engineering	Infocommunications
Specialization Subject 1	Data-Driven Systems BMEVIAUAC15	Development of Cloud Native Network Functions BMEVITMAC12
Specialization Subject 2	Object-Oriented Software Design BMEVIIIAC09	Network and Traffic Management BMEVIHIAC11
Specialization Subject 3	Automated Software Engineering BMEVIMIAC20	Mobile Communication Networks BMEVIHIAC10
Specialization Laboratory	Data-Driven Software Development Lab BMEVIAUAC16	Cloud Native Technologies Laboratory BMEVITMAC13
Project Laboratory	BMEVIAUAL04 BMEVIIIAL04 BMEVIMIAL04	BMEVIHVAL04 BMEVIHIAL04 BMEVITMAL04
BSc Thesis Project	BMEVIAUAT02 BMEVIIIAT02 BMEVIMIAT02	BMEVIHIAT02 BMEVITMAT02

Project Subjects

Within the frames of specialization, students take so-called project subjects from the 6th semester. Project laboratory is the pre-requisite for the BSc Thesis project. The project subjects can be both taken in the spring and fall semesters.

Students solve more challenging technical problems (projects) in groups or individually during project subjects. 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 10 credits to widen their knowledge from the list of available courses announced by the Faculty. The ten credit criteria can either be achieved by any 2-credit or 4-credit subject combinations.

The list of free elective courses may vary from year to year. The updated list can be found on the Faculty's website.

Summer Internship

Eight weeks, a full-time summer internship is mandatory. The suggested period is the summer between the 6th and 7th semesters. The subject has to be registered for next semester. Details are available on the Faculty's webpage.

The transition of the BSc curriculum from September 2022

The curriculum of the BSc program of electrical engineering has been slightly modified from September 2022, which means that the number of credits and the codes of certain subjects had to be changed.

Students having their signatures from previous semesters should register for the exam course under the previous subject code. Students who have not obtained a signature must take the subjects with the codes according to the new curriculum. The correspondence between the subjects of the old and new curriculum can be found on the Faculty's website.

Due to the modifications to the number of credits mentioned above, students may have fewer or more credits in certain subjects based on the previous curriculum. In this case, the amount of credits should be added up, and the difference should be adjusted by selecting Free Elective courses. In other words, students having less credits should register for more Free Elective courses; students having more credits should select courses from the list of Free Electives that are worthless credits. The goal is to fulfill the minimum 210-credit criteria of the curriculum by the end of the program. Students who do not complete a minimum of 210 credits or do not complete one of the compulsory subjects cannot get a BSc degree.