

# Faculty of Electrical Engineering and Informatics

## IMPORTANT NOTES

If for one subject you can find several different types (lecture, practice, laboratory) of courses then please choose one and only one course from each type in order to be able to perform the subject's requirements successfully. Civil Engineering courses are on the website separately. Courses chosen from the offer of Faculty of Civil Engineering will be checked and arranged individually by the departmental coordinator.

Subject code	Subject name			Requirement	ECTS credit
BMEVIAUAC12	Microcontroller Based Systems			Exam	5
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>		
Lecture	AEe	English	MON:14:15-16:00		
Practice	AGYe	English	THU:14:15-16:00		
Subject code	Subject name			Requirement	ECTS credit
BMEVIAUAC15	Data-Driven Systems			Exam	5
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>		
Lecture	AEe	English	TUE:14:15-16:00		
Practice	AGYe	English	THU:10:15-12:00		
Subject code	Subject name			Requirement	ECTS credit
BMEVIEEA00	Basics of Programming 1			Mid-semester mark	7
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>		
Laboratory	AL	English	THU:10:15-12:00(R4K,R4D)		
Laboratory	AL2	English	THU:12:15-14:00(R4K,R4D)		
Lecture	AE	English	WED:08:15-10:00(E1C)		
Practice	AG	English	FRI:12:15-14:00		
<a href="https://portal.vik.bme.hu/kepzes/targyak/VIEEA00/en/">https://portal.vik.bme.hu/kepzes/targyak/VIEEA00/en/</a> The main objective of this course is to provide students with appropriate skills in computer-based problem solving and basic use of program development tools. These skills are to be effectively applied during further studies. The C language is selected as working language to illustrate how portable programs can be developed and to allow students to gain practice in actual coding. The classroom practice follows the syllabus of lectures; helps better understand the topics of the lecture through detailed examination of the algorithms. The classes are completed with a long-term individual homework assignment to help improve the students' skills.					
Subject code	Subject name			Requirement	ECTS credit
BMEVIEEAB01	Microelectronics			Exam	5
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>		
Laboratory	AL01E	English	FRI:12:15-14:00		
Laboratory	AL02E	English	FRI:14:15-16:00		
Lecture	AEE	English	WED:10:15-12:00		
Subject code	Subject name			Requirement	ECTS credit
BMEVIEEAV18	Development and Production of Medical Devices			Exam	4
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>		
Lecture	01	English	TUE:12:15-14:00(QB309)		
Practice	02	English	THU:12:15-14:00(QB-310)		

Subject code	Subject name		Requirement	ECTS credit
BMEVIETAB00	Electronics Technology and Materials		Mid-semester mark	6
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Laboratory	10_LA	English	THU:14:15-18:00(V1C)	
Lecture	10_EA	English	TUE:12:15-14:00(E305ab); TUE:12:15-14:00(E305ab); WED:16:15-18:00(TANSZEK)	
<a href="https://portal.vik.bme.hu/kepzes/targyak/VIETAB00/en/">https://portal.vik.bme.hu/kepzes/targyak/VIETAB00/en/</a>				
Subject code	Subject name		Requirement	ECTS credit
BMEVIETAB01	Electronics Technology		Mid-semester mark	4
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Laboratory	2_LA	English	THU:14:15-18:00(V1C)	
Lecture	2_EA	English	TUE:12:15-14:00(E305ab)	
Subject code	Subject name		Requirement	ECTS credit
BMEVIETMA13	Photonics Devices		Exam	5
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Lecture	2_EA	English	WED:08:15-10:00(V1102); WED:08:15-10:00(V1102); THU:08:15-10:00(E305ab)	
Practice	2_GyA	English	THU:08:15-10:00(E305ab)	
Subject code	Subject name		Requirement	ECTS credit
BMEVIHIAA01	Basics of Programming 1		Mid-semester mark	7
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Laboratory	LA	English	THU:10:15-12:00(R4L)	
Lecture	EA	English	WED:08:15-10:00	
Practice	GA	English	FRI:12:15-14:00	
<a href="https://portal.vik.bme.hu/kepzes/targyak/VIHIAA01/en/">https://portal.vik.bme.hu/kepzes/targyak/VIHIAA01/en/</a>				
Subject code	Subject name		Requirement	ECTS credit
BMEVIHIAC10	The Role of Mobile Networks in Digitization		Exam	5
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Lecture	EA	English	WED:08:15-10:00	
Practice	GA	English	FRI:10:15-12:00	
Subject code	Subject name		Requirement	ECTS credit
BMEVIHIAV06	Introduction to Quantum Computing and Communication		Mid-semester mark	2
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Lecture	E_ERASMUS	English	THU:12:15-14:00	
<a href="https://portal.vik.bme.hu/kepzes/targyak/VIHIAV06/en/">https://portal.vik.bme.hu/kepzes/targyak/VIHIAV06/en/</a>				
The quantum mechanics-based algorithms and protocols can play an important role in our nowadays used technical solutions. Quantum computing and quantum communications is no longer belongs to the world of scientific laboratories since more and more products are offered by different companies in the market. This course gives an overview on different areas of quantum computing and communication including qubits, quantum registers, quantum gates and different quantum algorithms (Grover, Deutsch-Jozsa, Shor, etc.) and protocols (including quantum teleportation and quantum key distribution).				
Subject code	Subject name		Requirement	ECTS credit
BMEVIHIAV38	The Quality of Experience of Systems and Services		Exam	4
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Lecture	EA	English	TUE:12:15-14:00; THU:12:15-14:00	

Subject code	Subject name		Requirement	ECTS credit
BMEVIHIAV39	Administrating Computer Networks in Practice I.		Mid-semester mark	2
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Laboratory	LA2_ERASMUS	English	WED:16:15-18:00(IL107)	
<a href="https://portal.vik.bme.hu/kepzes/targyak/VIHIAV39/en/">https://portal.vik.bme.hu/kepzes/targyak/VIHIAV39/en/</a> The basic objective of "Administrating Computer Networks I." is to introduce the practical administration of computer networks - including network design, installation, and configuration of network devices. This subject gives the basics of "Administration Computer Networks in Practice II." (VIHIAV42) subject, thus providing adequate theoretical and practical knowledge and the way of its direct application. The students who successfully complete also the subject "Administrating Computer Networks II" acquire the knowledge and skills required for the Cisco CCNA (Cisco Certified Network Associate) certification. The certification can be obtained in authorized examination centers, independently from the University education.				
Subject code	Subject name		Requirement	ECTS credit
BMEVIHIAV44	Publication of Scientific Papers		Mid-semester mark	2
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Lecture	EA	English	MON:12:15-14:00	
Subject code	Subject name		Requirement	ECTS credit
BMEVIHIMA16	Advanced Mobile and Wireless Networks		Exam	5
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Lecture	EA	English	THU:10:15-12:00	
Practice	GA	English	WED:10:15-12:00(IB111)	
Subject code	Subject name		Requirement	ECTS credit
BMEVIHVAB02	Signals and Systems 2		Exam	6
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Lecture	EA	English		
Practice	GA	English	WED:12:15-14:00; WED:12:15-14:00; THU:08:15-10:00	
Subject code	Subject name		Requirement	ECTS credit
BMEVIHVAD00	System Theory		Mid-semester mark	5
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Lecture	EA	English	MON:10:15-12:00	
Practice	GA	English	FRI:08:15-10:00(V1501)	
Subject code	Subject name		Requirement	ECTS credit
BMEVIIIAC06	Robotized Manufacturing Systems		Exam	5
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Lecture	AE	English	WED:14:15-16:00(IL408)	
Practice	AG	English	THU:08:15-10:00(IL406)	
Subject code	Subject name		Requirement	ECTS credit
BMEVIMIAC16	Artificial Intelligence		Exam	5
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Laboratory	LA_ERASMUS	English	WED:14:15-16:00(IL307)	
Lecture	EA_ERASMUS	English		

Subject code	Subject name		Requirement	ECTS credit
BMEVIMIAD00	Embedded Information Systems		Mid-semester mark	3
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Lecture	EA	English	TUE:14:15-16:00	
Practice	GA	English	TUE:16:15-17:00	
<a href="https://portal.vik.bme.hu/kepzes/targyak/VIMIAD00/en/">https://portal.vik.bme.hu/kepzes/targyak/VIMIAD00/en/</a>				
Subject code	Subject name		Requirement	ECTS credit
BMEVITMAK47	Engineering Management Methods		Mid-semester mark	2
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Lecture	AE1	English	WED:14:15-16:00	
<p>Engineer as a leader (situations and solution): role of informaticians and electrical engineers in the information based society. General trends, business models and the development of value chains. Leader roles, leader tasks and situations. Management of IT based, communication related and business functions in a company. Complex engineering methods in the information transmission and processing, technological and economical optimization of the related processes. Management problems of resource and time allocation, task distribution and scheduling, and workforce placement. Decision preparation techniques: statistical and heuristics based methodologies. Innovation management: tools of innovation management, institutions of innovation management, funding models and typical calls for applications. Organizations of scientific research and technology development, business models of spin-off companies. Conception of technological visions about the future, ways to identify technological breakthroughs, management of generation changes. The process of standardization, its organization and its consequences on technological markets. Intellectual property rights during the innovation process: protection of technical creations, neighboring rights, protection of databases. New trends in IP rights: free software licensing models. Processes of product development and product introduction to the market, market study and marketing methodology. The role of IT technologies in the product and business development, their contribution to the value creation.<a href="https://portal.vik.bme.hu/kepzes/targyak/VITMAK47/en/">https://portal.vik.bme.hu/kepzes/targyak/VITMAK47/en/</a></p>				
Subject code	Subject name		Requirement	ECTS credit
BMEVIVEAB02	Electrotechnics		Exam	5
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Laboratory	2425_1_VIVE AB02_lab_angular	English	FRI:09:15-12:00	
Lecture	2425_1_VIVE AB02_elm_angular	English	MON:10:15-12:00; MON:10:15-12:00; TUE:08:15-10:00	
<a href="https://portal.vik.bme.hu/english/students/subjects/VIVEAB02/en/">https://portal.vik.bme.hu/english/students/subjects/VIVEAB02/en/</a>				
<p>The students should acquire basic knowledge related to the topic of electrotechnics. It lays the foundation for the Electric Power Engineering subject and at the same time a theoretical and practical foundation for those who continue their studies on the Sustainable Electric Power Engineering specialization. They will achieve all of this through the transfer of the following knowledge:</p> <p>Basics of electrotechnics. Calculation methods used in electrotechnical practice. Application of the presented methods by solving practical examples. Operation of single- and three-phase transformers, basic methods suitable for testing their operation in symmetrical steady state. Based on the knowledge of the magnetic field of the basic electromechanical converters, the acquisition of their operating principles. Basics of power electronics and electric drive technology. Programs simulating the operation of electric circuits, machines, power electronic units, with application examples. Environmental aspects of electrotechnics, basics of electromagnetic compatibility. Electrical safety technology and protection against electric shock. Basic methods and devices for electrical energy storage. Current and future essential applications of electrotechnics.</p>				
Subject code	Subject name		Requirement	ECTS credit
BMEVIVEAC10	Electrical Machines and Drives		Exam	5
<b>Course type</b>	<b>Course code</b>	<b>Course language</b>	<b>Timetable information</b>	
Lecture	2425_1_VIVE AC10_elm_angular	English	WED:08:15-10:00	
Practice	2425_1_VIVE AC10_gyak_angular	English	THU:08:15-10:00	
<a href="https://portal.vik.bme.hu/english/students/subjects/VIVEAC10/en/">https://portal.vik.bme.hu/english/students/subjects/VIVEAC10/en/</a>				
<p>The purpose of the course is to teach the essential professional knowledge related to the topic of electric rotating</p>				

machines and drives, which are necessary for electrical engineering students studying the Sustainable Electric Power Engineering specialization and who intend to work in this field later on. Through the study of operating conditions, the course presents the modelling and calculation methods used in practice, and also conveys comprehensive professional knowledge related to the operation of electric rotary machine systems. It discusses typical and modern applications as well as future ones. It provides a theoretical and practical foundation for those who continue their studies in this field in MSc courses. Its purpose is to learn the basic principles of electromechanical energy conversion, the construction and operation of the most important types of electric rotary machines, their equivalent circuits, and their electrical and mechanical characteristic curves; examination of the steady-state operation of three-phase machines in the case of symmetrical and asymmetrical power supply; presentation of the basics of space vector methods and the basics and typical applications of electric drive technology.

Subject code	Subject name		Requirement	ECTS credit
BMEVIVEAC11	Electrical Equipment and Insulations		Exam	5
Course type	Course code	Course language	Timetable information	
Lecture	2425_1_VIVEAC11_elm_angol	English	MON:14:15-16:00	
Practice	2425_1_VIVEAC11_gyak_angol	English	THU:14:15-16:00	

<https://portal.vik.bme.hu/english/students/subjects/VIVEAC11/en/>

The aim is to provide knowledge about the components of the electric power network, construction of the equipment, their role and requirements, and the most important physical phenomena. The calculations consist of practical cases of the above.

Subject code	Subject name		Requirement	ECTS credit
BMEVIVEAC17	Innovative Technologies in Electrotechnics		Exam	5
Course type	Course code	Course language	Timetable information	
Lecture	2425_1_VIVEAC17_elm_angol	English	WED:14:15-16:00	
Practice	2425_1_VIVEAC17_gyak_angol	English	FRI:10:15-12:00	

<https://portal.vik.bme.hu/english/students/subjects/VIVEAC17/en/>

In the 21st century, one of humanity's greatest challenges is ensuring sustainable growth in the face of growing energy demand. Conventional technologies in the field of electricity are slowly reaching their limits, and the use of innovative technologies in the generation, distribution, storage and use of electricity is essential to ensure sustainability. This course presents innovative technologies and solutions in electrical engineering and electricity. Particular attention will be paid to technologies based on dielectric and electrostatic fundamental phenomena, both on the generation and the user side. Technological solutions to extend the lifetime of existing network equipment will be discussed in detail. The physiological effects of electric and magnetic fields and electromagnetic fields related to power engineering are also discussed.

Subject code	Subject name		Requirement	ECTS credit
BMEVIVEMA17	Protection Systems and Measurement Technology		Exam	5
Course type	Course code	Course language	Timetable information	
Lecture	2425_1_VIVEMA17_elm_angol	English	THU:10:15-12:00	
Practice	2425_1_VIVEMA17_gyak_angol	English	WED:10:15-12:00	

<https://portal.vik.bme.hu/english/students/subjects/VIVEMA17/en/>

The goal of the course is to help students to be familiar with the theory of protection devices and their set-up methodology used to clear faults in power systems, power plants, industrial and communal networks. Understanding state of the art measurement technology and signal processing related to execution of intelligent protection algorithms in power systems. Furthermore, to be familiar with the automation systems.

Subject code	Subject name		Requirement	ECTS credit
BMEVIVEMA19	Electrical Insulations and Discharges		Exam	5
Course type	Course code	Course language	Timetable information	
Lecture	2425_1_VIVE MA19_elm_a ngol	English	WED:08:15-10:00; WED:08:15-10:00; THU:08:15-10:00	
Practice	2425_1_VIVE MA19_gyak_ angol	English	THU:08:15-10:00	
<a href="https://portal.vik.bme.hu/english/students/subjects/VIVEMA19/en/">https://portal.vik.bme.hu/english/students/subjects/VIVEMA19/en/</a> Electrical insulation technology is one of the classical branches of electrical engineering. However, in the 21st century, the progress of the field is accelerating, as most applications require insulation and insulating materials that are increasingly resistant to special stresses. In response to these challenges, special polymers, their composites, and nanocomposite polymers have emerged, as it has been found that adding nanoparticles can further enhance the beneficial properties of polymers. In this course, the electrical phenomena are introduced to the electrical in electrical insulating materials and insulations. The phenomenon of dielectric polarisation in different materials and the basics of the elementary processes will be reviewed. The electrical discharges and breakdown processes in different states of matter are presented. For both discharge and dielectric processes, the practical implications are presented in areas of electrical engineering where insulations are subjected to extreme electrical and environmental stresses.				
Subject code	Subject name		Requirement	ECTS credit
BMEVIVEMA23	Computer Aided Design in Building's Electricity		Exam	5
Course type	Course code	Course language	Timetable information	
Lecture	2425_1_VIVE MA23_elm_a ngol	English	MON:08:15-10:00	
Practice	2425_1_VIVE MA23_gyak_ angol	English	WED:14:15-16:00	
<a href="https://portal.vik.bme.hu/english/students/subjects/VIVEMA23/en/">https://portal.vik.bme.hu/english/students/subjects/VIVEMA23/en/</a> Need for engineers with skills connected to Building's electricity is very significant. Our goal to give such skills for the student that help to fulfil this need providing knowledge about computer aided design of electric systems of buildings.				
Subject code	Subject name		Requirement	ECTS credit
BMEVIVEMB05	Electric Energy Market		Exam	5
Course type	Course code	Course language	Timetable information	
Lecture	2425_1_VIVE MB05_elm_a ngol	English	TUE:14:15-16:00	
Practice	2425_1_VIVE MB05_gyak_ angol	English	TUE:16:15-18:00	
<a href="https://portal.vik.bme.hu/english/students/subjects/VIVEMB05/en/">https://portal.vik.bme.hu/english/students/subjects/VIVEMB05/en/</a> This course is intended to provide basic theoretical and practical training on electricity markets that have already fully integrated with the operation of power systems. The course introduces the power market participants, stakeholders, their connections and interactions, along with market structures, the necessary legal, technical, economical aspects, investment incentive schemes as well as the tradable products and services connected to electricity supply. Through the examples cited from European power markets the obtained knowledge about the methods, principles and mechanisms used in electricity trading and throughout the power markets creates a possibility for the students to join the workforce of an electricity trading company or a market oriented supplier, network or system operator.				