

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
BMEVIAUAB00	Software Techniques			Exam	5
Course type	Course code	Course language	Timetable information		
Laboratory	ALE	English	THU:10:15-12:00		
https://portal.vik.bme.hu/kepzes/targyak/VIAUAB00/en/					
Subject code	Subject name			Requirement	ECTS credit
BMEVIEEAB00	Microelectronics			Exam	5
Course type	Course code	Course language	Timetable information		
Laboratory	al1e	English	FRI:08:15-10:00		
Lecture	aee	English	MON:14:15-16:00		
https://portal.vik.bme.hu/kepzes/targyak/VIEEAB00/en/ The basic goal of the course is to deepen the already acquired knowledge in the field of digital electronics through presenting the latest implementation techniques of digital integrated circuits. Further goals of the subject are to provide information on the basics of analogue integrated circuits, components of power electronics and solid-state lightning. Today's electronics and IT devices are all based on different special discrete semiconductors and complex integrated circuits. Solid knowledge regarding the structure, operation and manufacturing of these devices is among the necessary skills of today's electrical engineers including basics of IC design at least on the level which allows effective communication with IC design specialists. They have to know how system level design connects with the IC design as well. Special emphasis is put on the corresponding practical skills through simple case studies (calculation examples) as well as computer laboratory practices where the students get acquainted with the basic steps IC design. An important aspect of the course is to bridge the gap between the operation of abstract electronics components and the physical reality: the major components used in ICs (diodes, transistors, etc.) are discussed in detail. A detour is made towards the MEMS and MOEMS, where electrical operation is combined with mechanical and optical effects.					
Subject code	Subject name			Requirement	ECTS credit
BMEVIETAA01	Materials in Electronics			Mid-semester mark	2
Course type	Course code	Course language	Timetable information		
Lecture	02_a	English	WED:12:15-14:00		
Lecture	02_n	German			
Subject code	Subject name			Requirement	ECTS credit
BMEVIHIAA03	Computer Architectures			Exam	5
Course type	Course code	Course language	Timetable information		
Lecture	EA	English	WED:08:15-10:00; WED:08:15-10:00; THU:10:15-12:00		
Practice	EG	English	THU:10:15-12:00		
Subject code	Subject name			Requirement	ECTS credit
BMEVIHIAB03	Electronics 1			Exam	5
Course type	Course code	Course language	Timetable information		
Lecture	E_ERASMUS	English	WED:10:15-12:00		
Practice	G_ERASMUS	English	THU:10:15-12:00		

Subject code	Subject name			Requirement	ECTS credit
BMEVIHAC01	IT Security			Mid-semester mark	3
Course type	Course code	Course language	Timetable information		
Lecture	EA	English	WED:09:15-12:00		
https://portal.vik.bme.hu/kepzes/targyak/VIHAC01/en/ This course gives an overview of the different areas of IT security with the aim of increasing the security awareness of computer science students and shaping their attitude towards designing and using computing systems. The course prepares BSc students for security challenges that they may encounter during their professional carrier, and at the same time, it provides a basis for those student who want to continue their studies at MSc level. We put special emphasis on software security and the practical aspects of developing secure programs.					
Subject code	Subject name			Requirement	ECTS credit
BMEVIHIAV35	Privacy-Preserving Technologies			Mid-semester mark	2
Course type	Course code	Course language	Timetable information		
Lecture	EA	English	WED:12:15-14:00		
https://portal.vik.bme.hu/kepzes/targyak/VIHIAV35/en/ This course provides an introduction into the practical problems of data protection and privacy. Students can develop skills of understanding and assessing privacy threats and designing countermeasures. The course focuses on the problem of unwanted personal and sensitive data leakage from different information sources (e.g., large datasets, web-tracking, encrypted traffic, source/binary code, machine learning models), and its detection as well as mitigations using Privacy Enhancing Technologies (PETS). The objective of the course is to provide skills needed by Data Protection Officers (DPO) and also required by the European General Data Protection Regulation (GDPR).					
Subject code	Subject name			Requirement	ECTS credit
BMEVIHIAV37	V2X Communication Technologies of Autonomous Vehicles			Exam	4
Course type	Course code	Course language	Timetable information		
Lecture	EA	English	TUE:12:15-14:00		
Practice	GA	English	THU:12:15-14:00		
Subject code	Subject name			Requirement	ECTS credit
BMEVIHIAV39	Administrating Computer Networks in Practice I.			Mid-semester mark	2
Course type	Course code	Course language	Timetable information		
Laboratory	LA2	English	WED:16:15-18:00(IL107)		
https://portal.vik.bme.hu/kepzes/targyak/VIHIAV39/en/ 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
BMEVIHIMA07	Mobile and Wireless Networks			Exam	4
Course type	Course code	Course language	Timetable information		
Lecture	EA	English			
Practice	GA	English			
https://portal.vik.bme.hu/kepzes/targyak/VIHIMA07/en/ The objective of this course is to introduce today's modern wireless and mobile systems to our students. This contains basic knowledge needed to operate and maintain such networks. Further goal of this course is to show the possibilities and operations of advanced radio and wireless solutions, through practical examples.					

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Subject code	Subject name	Requirement	ECTS credit
BMEVIHIMA24	Quantum Computers and their Applications	Exam	5

Course type	Course code	Course language	Timetable information
Lecture	EA	English	WED:08:15-10:00
Practice	GA	English	THU:14:15-16:00

Subject code	Subject name	Requirement	ECTS credit
BMEVIHVAA03	Signals and Systems 1	Exam	6

Course type	Course code	Course language	Timetable information
Lecture	EA	English	MON:14:15-16:00; MON:14:15-16:00; TUE:10:15-12:00
Practice	GA	English	TUE:10:15-12:00; THU:12:15-14:00; THU:12:15-14:00

Subject code	Subject name	Requirement	ECTS credit
BMEVIHVMA01	Broadband Wireless Telecommunication and Broadcasting Systems	Exam	4

Course type	Course code	Course language	Timetable information
Lecture	EA	English	
Practice	GA	English	

<https://portal.vik.bme.hu/kepzes/targyak/VIHVMA01/en/>

Subject code	Subject name	Requirement	ECTS credit
BMEVIHVMA07	Communication Theory	Mid-semester mark	4

Course type	Course code	Course language	Timetable information
Lecture	EA	English	

<https://portal.vik.bme.hu/kepzes/targyak/VIHVMA07/en/>

Subject code	Subject name	Requirement	ECTS credit
BMEVIIIAB10	Control Engineering	Exam	5

Course type	Course code	Course language	Timetable information
Laboratory	AL	English	WED:14:15-16:00
Lecture	AE	English	THU:08:15-10:00
Practice	AG	English	WED:14:15-16:00

Subject code	Subject name			Requirement	ECTS credit
BMEVIIIIMA21	Robot Manipulators and Mobile Robots			Exam	5
Course type	Course code	Course language	Timetable information		
Lecture	AE	English	WED:08:15-10:00		
Practice	AG	English	THU:14:15-16:00		
Subject code	Subject name			Requirement	ECTS credit
BMEVIMIAB02	Measurement Technology			Exam	6
Course type	Course code	Course language	Timetable information		
Laboratory	LA	English	FRI:10:15-12:00		
Lecture	EA	English	TUE:14:15-17:00		
Practice	GA	English	THU:14:15-16:00		
Subject code	Subject name			Requirement	ECTS credit
BMEVIMIAV07	ARM Cortex Core Microcontrollers			Exam	4
Course type	Course code	Course language	Timetable information		
Laboratory	LA	English	THU:13:15-14:00		
Lecture	EA	English	TUE:12:15-14:00		
Practice	GA	English	THU:12:15-13:00		
Subject code	Subject name			Requirement	ECTS credit
BMEVIMIMA23	Measurement Theory			Exam	5
Course type	Course code	Course language	Timetable information		
Lecture	EA	English	TUE:14:15-17:00		
Subject code	Subject name			Requirement	ECTS credit
BMEVIMIMA26	Formal Methods			Mid-semester mark	5
Course type	Course code	Course language	Timetable information		
Lecture	EA	English	MON:14:15-17:00		
Subject code	Subject name			Requirement	ECTS credit
BMEVITMAB05	Infocommunications			Exam	6
Course type	Course code	Course language	Timetable information		
Lecture	AE1	English	WED:12:15-14:00; WED:12:15-14:00; THU:12:15-14:00		
Practice	AG1	English	FRI:12:15-14:00		
Subject code	Subject name			Requirement	ECTS credit
BMEVITMAB06	Communication Networks			Exam	7
Course type	Course code	Course language	Timetable information		
Laboratory	ALER	English	MON:14:15-18:00		
Lecture	AER	English	MON:12:15-14:00; WED:08:15-10:00		
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Subject code	Subject name			Requirement	ECTS credit
BMEVITMAC02	Information Systems Management			Mid-semester mark	4
Course type	Course code	Course language	Timetable information		
Laboratory	AL1	English	WED:14:15-18:00		
Lecture	AE1	English	THU:10:15-12:00		
https://portal.vik.bme.hu/kepzes/targyak/VITMAC02/en/					

Subject code	Subject name		Requirement	ECTS credit
BMEVITMMB03	Engineering Management		Exam	4
Course type	Course code	Course language	Timetable information	
Lecture	AE1	English	FRI:08:15-12:00	
<p>Engineering management (EM) in the knowledge-based society. Definition, role and areas of the EM. The evolution of the EM discipline. Peculiarities, generic trends and EM of the information, communication and electronic media technologies (ICT). Managerial elements of the engineering activity. Components and principles of the managerial activity. Managerial situations, methods and tools. Strategic management. Strategy types and parts. Business strategic planning methods. Classes of competitive strategies. Implementation of strategy: success factors, progress tracing. Methods of the strategic direction and control. Complex engineering decision problems, customer-oriented and systemic approaches, solutions, procedures. Planning and allocation of resources, multi-project management. Management of organizations. Organization types in the ICT sector. Lifecycle, decision culture of organizations, change management. Managing cooperation of organizations, complex working groups. Knowledge management. Knowledge process: accumulation, internalization, adaptation, externalization. Competence. Knowledge sharing and transfer. Knowledge based systems. Types of the intellectual property, principles of intellectual property rights. Open access software. Exploitation of the intellectual properties. Intellectual public utilities. ICT specific EM. Technology management. Technological planning, forecast, transfer, launching, change. Making technology vision, analyzing driving forces, scenarios. Technology-driven business strategies. Corporate ICT functions. Application of the ICT in shaping new business strategies, global work-flows, efficient organization structures. Innovation management. Goals of research, development and innovation. Innovation models and metrics. Management of the innovation process, quality and risks. Innovation chain: university-industry partnership, role of the government. Multi-tier organization and operation of the research-development-innovation management. Innovation financing. National and EU sources, grants, funds, tenders. Development projects. Technological incubators, innovation centers, start-up companies, technological consortia in the ICT sector. Product management. Goals and process of the product development. Markets of the ICT products and services. Market players, competitive environment. Market segmentation. Life-cycle of the product, and its management. Product pricing, price-sensitivity of the customers. Market-research, sale and sale-support methods. Business process management. Analyzing, planning, regulating, improving and transforming corporate business process. Criteria of the process-based management systems. Methods for developing processes. IT in the corporate value creation. Customer relationship management (CRM), operation support systems, supply chain management, business continuity management. Special business functions (e.g. billing), industry-specific systems, IT system architecture of telecommunication service providers. Regulatory environment. Sector regulation. Goals and principles of the regulation in general and in the networked and public service sectors. Competition regulation, consumer protection. Regulatory institutions and procedures, ex-ante and ex-post regulation, self-regulation, public hearing, standards. Regulation of the information and communication technologies and markets. Technology and market regulatory models in the ICT sector. Regulatory tasks for deploying the convergence of the telecommunications, information and media technology sectors. Community and national regulation of the electronic communications network and services. Framework and specific directives. Rules for the cooperation of the network operators and service providers. Regulation for managing scarce resources, frequency, number and address management. Concept for regulating information security, data protection and content.https://portal.vik.bme.hu/kepzes/targyak/VITMMB03/en/</p>				
Subject code	Subject name		Requirement	ECTS credit
BMEVIVEAB03	Power Engineering		Mid-semester mark	4
Course type	Course code	Course language	Timetable information	
Laboratory	2324_2_VIVE AB03_lab_angol	English	MON:14:15-18:00	
Lecture	2324_2_VIVE AB03_elm_angol	English	WED:08:15-10:00	
Practice	2324_2_VIVE AB03_gyak_angol	English	FRI:10:15-12:00	
Subject code	Subject name		Requirement	ECTS credit
BMEVIVEMA03	Power System Transients		Exam	4
Course type	Course code	Course language	Timetable information	
Lecture	2324_2_VIVE MA03_elm_angol	English		
Practice	2324_2_VIVE MA03_gyak_angol	English		
<p>https://portal.vik.bme.hu/kepzes/targyak/VIVEMA03/en/ Objectives, learning outcomes and obtained knowledge:</p>				

Understanding physics processes of electromagnetic transients in power systems, being familiar with the origin of transients and their consequences to the operation of electrical energy system. The aim of the course is to help students in understanding transient phenomena appearing at abnormal conditions (e.g. switching on or off, during short-circuit and fault clearing), to be familiar with design practices and protection principles against overvoltages and to get deep understanding about operation of advanced solution methods to reduce the risk of failures. Practical lectures are dedicated to develop simplified equivalent circuits and calculation methods. Students will have an opportunity to learn how to operate modern power system transient simulation software tools and how to create digital models and evaluate results obtained by computer simulation

Synopsis: a) The role of electromagnetic transients in the operation and reliability of the electric power systems. b) Electromagnetic wave propagation - Ideal single phase – earth return system: Laws governing wave propagation in an ideal single-phase-ground return system. Characteristics and calculation methods of transients resulting from multiple reflexion of electromagnetic waves. - Exercise: Characteristics of electrical circuits composed by lumped and distributed parameter elements, transients on transmission lines caused by line energization, de-energization and reclosing, protection measures against over-stresses, discharging lines and cables, transients caused by short distance fault current interruption. c) Reference circuits for transient studies: - The purpose and construction rules of reference-circuits. - Reference circuits of electrical systems of mixed structure with lumped inductance and capacitance. - Exercise: Ferranti effect, steady state voltage rise at the end of long EHV lines, switching transients when energising long OHLs. Protecting substation equipment against lightning overvoltages, influence of long and short cable sections at SS entrance d) Wave propagation on multiphase systems, identification of modular waves. Line energization and reclosing transients on multiphase systems. Reclosing with and w/o faults on EHV lines. Interrupting line charging currents, influence of trapped charge on switching transients. Exercise: Simulation of switching transients on multiphase lines by using ATP-EMTP software. Line energization with closing resistor. Point-on-wave reclosing, polarity reclosing e) Influence of losses: conductor and earth return losses, corona loss f) Modelling winding structure of transformer, shunt reactor and rotating machines for transient studies. g) Numerical methods and sw tools suitable for studying electromagnetic transients