

## Assessment and subject description

<b>Óbuda University</b> Kandó Kálmán Faculty of Electrical Engineering		Department of Microelectronics and Technology		
Subject name and code: <b>Computers and interfaces</b>		<b>Credits: 4</b>		
<b>Optional subject</b>				
Course: Electrical engineering BSc, MSc, Mechatronical engineering BSc, MSc				
Responsible:		Teaching staff:	<b>Horváth Márk</b>	
Prerequisites:				
Contact hours per week:	Lecture: <b>2</b>	Class discussion.: 0	Lab hours: 0	Tutorial: 0
Assessment and evaluation:	<b>mid-term test</b>			
<b>Subject description</b>				
The goal of the subject is to give a general knowledge of structure and operation of microprocessors and microcontrollers, of computers and digital processing of information, of connecting analog and digital devices to microcontrollers. The teacher may change the topics to better suit the group's knowledge and needs.				
<b>Lecture topics</b>			<b>Week</b>	<b>Lessons</b>
Analogue-digital conversion. Digital representation of numbers, signed integers and fractional numbers.			<b>1.</b>	<b>2</b>
Information theory basics. Entropy, redundancy, channel capacity, compression of text. Lossless and lossy compression of images and audio. Error detection and correction coding. Encryption.			<b>2.</b>	<b>2</b>
Digital transmission on wire. Line codings. Time and spectral attributes. Serial and parallel transmissions.			<b>3.</b>	<b>2</b>
Radio and optical transmission. Modulations. Multiple access.			<b>4.</b>	<b>2</b>
Brief description of series protocols: RS-232; SPI; I2C ; RS-485 ; CAN ; USB			<b>5.</b>	<b>2</b>
Structure and operation of microprocessors. Execution of instructions.			<b>6.</b>	<b>2</b>
Pipeline, interrupts, DMA, etc.			<b>7.</b>	<b>2</b>
Computer motherboards, bus systems, other peripherals. Memory addressing methods.			<b>8.</b>	<b>2</b>
Basics of computer networks. Local and worldwide networks.			<b>9.</b>	<b>2</b>
General application, operation and structure of microcontrollers.			<b>10.</b>	<b>2</b>
Structure and operation of 8bit PIC microcontroller. Operation demonstration.			<b>11.</b>	<b>2</b>
Analog and digital interfacing to microcontrollers. Power supply, signal levels and their interfacing, overvoltage protections.			<b>12.</b>	<b>2</b>
Interfacing sensors, indicators and actuators to microcontrollers.			<b>13.</b>	<b>2</b>
Mid-term test.			<b>14.</b>	<b>2</b>
<b>Assessment and evaluation:</b>				
Participation in classes is strongly recommended. To have the subject accepted as foreign language criterion subject (for Hungarian students), participation is mandatory. The subject has a mid-term test at the end of the study period. Repeat test is available on last week at special time as agreed with the teacher if needed.				
<b>Suggested material:</b>				
Electronic material will be given.				