

Óbuda University Bánki Donát Faculty of Mechanical and Safety Engineering		Insitute of Mechatronics and Vehicle Engineering			
Subject title and code: Electronics BMXELY3BNE		Credits: 5			
Full-time study		2023/24 ac. 3 semester		year	
The course is available at:		mechatronical engineering			
Supervised by: Dr. István Nagy		Instructors: Norbert Berecz			
Prerequisite (neptun code):		Electrical Engineering (BMXETY2BNE)			
Weekly number of lessons					
Lecture: 2	Group seminar: 1	Lab: 1	Consultation: -		
Way of assessment: Exam		(Written and oral)			
Online consultation (in case it's required): ... (BBB link)					
Educational goal:	<p><i>Basic concepts of analog signal amplification, operating characteristics, transfer characteristics, a suitable substitute image for an asymmetric amplifier, linear four poles.</i></p> <p><i>Semiconductor structures, current conduction in semiconductors, P-N transition. Diode structure, characteristics, setpoint setting, application. The process of signal amplification. Structure, operation, characteristics and basic equations of a bipolar transistor. Structure, operation, characteristics of unipolar/field-effect-transistors (JFET, MOSFET), Methods for setting the operating point of transistors, description of the basic connections of small-signal replacement circuit. The basics of amplifier feedback. Definition, structure (block diagram), replacement circuit of the operational amplifier, properties of the ideal and real operational amplifier. Use of the operational amplifier.</i></p>				
Schedule					
Education week	Topics				
1.	Fundamentals of physics and electrochemistry of semiconductors PN transitions. Structure and operation of the semiconductor diode. Types and applications of diodes				
2.	Bipolar an FET transistor structures, operation				
3.	Operating point of transistors				
4.	1st Mid-term test				
5.	General amplifiers				
6.	Amplifier circuits with bipolar transistors				
7.	Amplifier circuits with FET transistors				
8.	2nd Mid-term test				
9.	Operational amplifier structure, operation, characteristics				
10.	Amplifier circuits with operational amplifier				
11.	Rector's break				
12.	Multi-stage amplifiers, power electronics				
13.	3rd Mid-term test				
14.	Retake				
Mid-semester requirements					
Test		Assignment to be submitted		Lab measurement	
amount	dates	amount	deadlines	amount	dates
3	4th week 8th week 13th week	-	-	-	-
<i>According to the Study and Examination regulations of Óbuda University attendance of group seminars and lab exercises are mandatory.</i>					
Other requirements for participation in sessions not covered by the regulations and restrictions on substitutions:					

Test		Assignment to be submitted		Lab measurement	
maximum points available	minimum score required to pass /test	maximum points available	minimum score required to pass / assignment	maximum points available	minimum score required to pass /lab points
30 points	16 points	points	points	points	points

Total number of points achievable in semester: 120 points				
Grading thresholds	satisfactory 48 points and above	average 67 points and above	good 85 points and above	excellent 103 points and above
Other evaluation criteria: If the mid-semester performance is stable above 71%, the student can receive an offered grade. In case of performance below this, an exam is required.				
Receive a signature denied entry:	A student who does not complete the mid-term tests for at least 41% will receive a Denied entry.			
Required references:	<i>U. Tiecez, Ch. Schenk: Analogue and digital electronic circuits, Springer, 2008, ISBN: 3540004297</i> <i>Thomas F. Schubert, Jr - Ernest M. Kim: Fundamentals of Electronics Book 1.</i> <i>Dr. K. Lal Kishore: Electronic Devices and Circuits</i> <i>Tony R. Kuphaldt: Lessons In Electric Circuits, Volume III – Semiconductors, 2009</i> <i>Tony R. Kuphaldt: Lessons In Electric Circuits, Volume VI – Experiments, 2010</i>			
Recommended references:	<i>Judt Balázsovicsné Szij: Electronic devices (lecture notes)</i>			
Quality assurance methods of the subject:				

Things, that are not included, can be found within the regulations of Óbuda University.