SYLLABUS

Basic information of the course	
University:	**University "Ukshin Hoti" - Prizren**
Academic unit:	**Faculty of Computer Science**
Study program:	**Information Technologies and Telecommunication**
Course:	**Eletronic Devices**
Study level:	**Bachelor**
Course status:	**Mandatory**
Study year:	**2**
Number of hours per week:	**2+2**
Credit value - ECTS:	**6**
Time / location:	**It will be published in the university web site!**
Lecturers:	**Prof. Dr. Edmond Beqiri**
Contact details:	**edmond.beqiri@unhz.eu**
Course description:	The electronic devices course for university students of engineering schools, especially for those who attend the computer science / engineering program. These students generally do not have a prior background in electronic components and electronic devices. Understanding the operation of the computer hardware system, however, is crucial to the scientists and engineers responsible for designing future IT products. Students will be introduced to electronic devices which represent the basis of IT construction and the operation of telecommunications.
Course objectives:	Development of students' specific knowledge of the elements of electronic devices which are the basic components for the construction of information and telecommunication systems. The aims of the course are: - To help students get acquainted with the structure and logic of operation of electronic devices used in IT and telecommunications - To acquaint students with the basics of operation, analysis and design of coupling diodes .BJT and FET transistors and amplifier circuits.

	- To understand the diode as a rectifier. - Study the basic principle of filter circuits and different types of filters - Assist students in evaluating and analyzing electronic device components - Enable students to create small IT and telecommunications hardware projects - To enable students to better integrate into their future work environment in the field of IT and telecommunications.
Learning outcomes:	Upon completion of this course the student will be able to: - Engineering skills and ambitions: Students will be able to evaluate and test electronic components - Leadership skills and ambitions: Students will be able to have self-confidence and skills in the field of TIT - Motivational skills: Students will learn how to motivate employees and their customers in the field of electronic devices and TIT - Sensitive skillsStudents will be able to experience awareness through interactive group work in the field of use of electronic devices - Critical Thinking, Creativity: Students will be encouraged to question the applicability of conventional recipes as well as the impact of non-quantitative information. - Analysis of customer motivation when purchasing ELECTRONIC products: Students will be able to create empathy with lay customers, having no background in IT and will learn how to better understand businesses and customer priorities . - Negotiation skills: The student will learn negotiation strategies and skills, pricing models. - Communication Skills: Students will improve their ability to express and complete their analysis and improve presentation skills.

Contribution on student load (must correspond with learning outcomes)			
Activity	**Hours**	**Days/week**	**Total/hours**

Lectures	2	15	30
Exercise theoretical/laboratory	2	15	30
Practice work	1	2	2
Contact with lecturer/consultations	1	5	5
Field exercises	1	1	1
Midterms	2	2	4
Laboratory exercises	2	2	4
Individual time spent studying (at the library or home)	3	10	30
Final preparation for the exam	5	6	30
Time spent in evaluation (tests, quiz, final exam)	2	3	6
Projects, presentations, etc.	4	2	8
Total			**150**

Notice: 1 ECTS credits = 25 hours commitment, e.g. if the course has 6 ECTS credits student must have 150 hours during the semester.

Teaching methods:	The course is a combination of lectures, discussions, numerical and laboratory exercises, while the assignments are presented by the laboratory course lecturers!
Assessment methods:	- Seminar paper: 10% - Tests I: 15% - Test II: 15% - Final exam: 50% - Participation in exercises: 5% - Group work on assignments and case studies: 5%

Assessment and grading:

Vlerësimi në %	**Nota përfundimtare**
91% - 100%	10
81% - 90%	9
71% - 80%	8
61% - 70%	7
51% - 60%	6
0% - 50%	5

Literature

Basic literature:	1. Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall™, 2012 2. Robert L. Boylestad & Louis Nashelsky, Electronic Devices and Circuit Theory, 11th Edition, Pearson, 2013
Additional literature:	1. ELECTRONIC DEVICES & CIRCUITS (Lectures), Department of Electronics &

	Communication Engineering, Malla Reddy College Of Engineering & Technology.

Study plan	
Week	**Lectures**
First week:	• Topic: Introduction. Presentation of the syllabus of the course • *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*
Second week:	• Topic: Introduction to electrical circuitsElectric quantities and SI units o Force, Labor and Power o Electric charge and electricity o Electric potential o Electricity and power o Constant and variable functions • *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*
Third week:	• Concepts of electrical circuits o Active and passive elements o Rules of symbols o Tension Voltage-current relations o Resistance o Inductance o Capacity o Circuit diagrams o Nonlinear resistors • *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*
Fourth week:	• Laws of electrical circuits o Kirkhof's law of electric voltage o Kirkhof's law of electricity o Serial connection of electrical circuit elements o Parallel connection of electrical circuit elements o Voltage divider o Electric current divider • *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*
Fifth week:	• Semiconductor diodes o Ideal diode o Semiconductor materials o Energy levels o Semiconductor materials of type p and n o Semiconductor diodes

	○ Resistance levels ○ Equivalent diode circuits ○ Diode specific data ○ Transition and diffusion capacity ○ Diode testing ○ Diode Zener ○ Light emitting diodes (LEDs) ○ Diode Fields — Integrated Circuits • *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*
Sixth week:	• Diode applications ○ Load line analysis ○ Diode approximations ○ Various configurations of DC input diodes ○ Parallel and parallel-series diode configurations ○ Gateway AND / OR ○ Sinusoidal inputs; Semiconductor driver ○ Other executives. ○ Clippers ○ Circuits for voltage multiplication. • *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*
Seventh week:	• Topic: The first test • *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*
Eighth week:	• Bipolar transistors ○ Transistor construction ○ The working principle of the transistor ○ Transistor as voltage amplifier ○ Common based scheme ○ Scheme with common emitter ○ Scheme with common collector ○ Transistor specific data ○ Testing and identification • *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*
Ninth week:	• DC - BJT polarization ○ Working point ○ Fixed polarization scheme ○ Polarized emitter polarization scheme ○ Diagram with voltage divider ○ Scheme with reverse connection to the collector ○ PNP transistors ○ Stabilization of polarization

	• *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*

Tenth week:	• FET field effect transistors
	  ○ Construction and characteristics of JFET
	  ○ Transfer features
	  ○ JFET specific data
	  ○ MOSFET with impoverishment
	  ○ MOSFET with enrichment
	  ○ VMOS
	  ○ CMOS
	• *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*

Eleventh week:	• FET polarizations
	  ○ Fixed polarization scheme
	  ○ Self-polarization scheme
	  ○ Diagram with voltage divider
	  ○ MOSFET polarization with depletion (narrowing)
	  ○ MOSFET polarization with enrichment (expansion)
	  ○ Circuits combined with BJT and FET
	• *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*

Twelfth week:	• Operational amplifiers
	  ○ Differential and joint action
	  ○ Basic data of operational amplifiers
	  ○ Practical circuits with operational amplifiers
	  ○ Inverter amplifier
	  ○ Non-converting amplifier
	  ○ Specific data of operational amplifiers
	• *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*

Thirteenth week:	• Other bipolar devices
	  ○ Diode Schottky
	  ○ Diode Varikap
	  ○ Power diodes
	  ○ Diode Tunnel
	  ○ Photodiodes
	  ○ Thermistors
	• *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*

Fourteenth week:	• Topic: Modern electronic equipment used to build hardware systems • *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*

Fifteenth week:	• Topic: The second test • *Literature: -Thomas L, Floyd, Electronic Devices, 9th Edition, Pearson Prentice Hall ™, 2012*

Exercises

Study plan	
Java	**Exercises**
First week:	• Distribution of course assignments.
Second week:	• Concept exercises with electrical circuitsElectric quantities and SI units o Force, Labor and Power o Electric charge and electric current o Electric potential o Electricity and power • Constant and variable functions
Third week:	• Exercises with Concepts of electrical circuits o Active and passive elements o Rules of symbols o Voltage-current relations o Resistance o Inductors o Capacity o Circuit diagrams • Nonlinear resistors
Fourth week:	• Exercises with the Laws of Electrical Circuits o Kirkhof's law of tension o Kirkhof's law of electricity o Serial connection of electrical circuit elements o Parallel connection of electrical circuit elements o Voltage divider • Electric current divider
Fifth week:	• Exercises with Semiconductor Diodes o Ideal diode o Semiconductor materials o Energy levels o Semiconductor materials of type p and n o Semiconductor diodes o Resistance levels o Equivalent diode circuits o Diode specific data o Transition and diffusion capacity o Diode testing o Diode Zener

	○ Light emitting diodes (LEDs) • Diode Fields — Integrated Circuits
Sixth week:	• Exercises with Diode Applications ○ Load line analysis ○ Diode approximations ○ Various configurations of DC input diodes ○ Parallel and parallel-series diode configurations ○ Gateway AND / OR ○ Sinusoidal inputs; Semiconductor driver ○ Other executives. • ClippersQarqet for voltage multiplication.
Seventh week:	• Exercises with the application of diodes
Eighth week:	• Exercises with Bipolar Transistors ○ Transistor construction ○ The working principle of the transistor ○ Transistor as voltage amplifier ○ Common based scheme ○ Scheme with common emitter ○ Scheme with common collector ○ Transistor specific data • Testing and identification
Ninth week:	• Exercises with DC Polarization - BJT ○ Working point ○ Fixed polarization scheme ○ Polarized emitter polarization scheme ○ Diagram with voltage divider ○ Scheme with reverse connection to the collector ○ PNP transistors • Stabilization of polarization
Tenth week:	• Exercises with Transistors with FET field effect ○ Construction and characteristics of JFET ○ Transfer features ○ JFET specific data ○ MOSFET with impoverishment ○ MOSFET with enrichment ○ VMOS • CMOS
Eleventh week:	• Exercises with FET Polarizations ○ Fixed polarization scheme ○ Self-polarization scheme ○ Diagram with voltage divider ○ MOSFET polarization with depletion (narrowing)

	○ MOSFET polarization with enrichment (expansion) • Circuits combined with BJT and FET
Twelfth week:	• Operational amplifiers ○ Differential and joint action ○ Basic data of operational amplifiers ○ Practical circuits with operational amplifiers ○ Inverter amplifier ○ Non-converting amplifier • Specific data of operational amplifiers
Thirteenth week:	• Exercises with Other Bipolar Equipment ○ Diode Schottky ○ Diode Varikap ○ Power diodes ○ Diode Tunnel ○ Photodiodes • Thermistors
Fourteenth week:	• Exercises with modern electronic equipment used to build hardware systems
Fifteenth week:	• Presentation of projects from students

Academic policies and rules of conduct
• Generally lecture presentations will be made through MS PowerPoint, tables, material usage, computer programs and numeric exercises. • Additional resources (scientific papers, publications, national bulletins, as well as recent discoveries and research) will be provided by professors. • In the absence of the opportunity for practical work to be organized weekly, in cooperation with the management of the university, this activity will be organized on certain days in: organizations, companies, etc. • During each session will be organized the conversation and co-participation with the students! • Students are required to be regular in lectures and exercises! • It will be evaluated when the students collaborate and participate in the lectures and course exercises! • Timely arrival in lectures and exercises is mandatory!