Discipline	ELECTRICAL ENGINEERING	code: *04*	**winter semester**
Specialty	Computer Systems and Technologies		
ECTS credits: **6**	Form of assessment: exam		
Lecturer	Assoc. Prof. Emil Panov, PhD Room 306 A E Phone: +359 52 383 553 E-mail: eipanov@tu-varna.bg		
Department	THEORY OF ELECTRICAL ENGINEERING AND MEASUREMENT		
Faculty	Faculty of Electrical Engineering		

Learning objectives

In the course "Electrical Engineering" the students are acquainted with the methods for exploration of linear electric circuits with constant parameters. The course focuses on the operation of the linear electric circuits in DC regime and AC regime. The basic quantities used to describe the circuits are the integral characteristics – the current and the voltage. The main properties and theorems for linear electrical circuits, as well as some phenomena in the linear circuits such as transmission of maximum power in the load, inductive power transmission, resonance phenomena, etc. are discussed.

Students get acquainted with the basic methods of analysis of linear electric circuits in: a) DC regime; (b) AC regime. The first section discusses DC regimes in linear electric circuits. In the second section the accent is placed on the harmonic regimes in the time domain. The definitions of the effective values of the voltage and the current (the so-called RMS) and for the different types of power are introduced, too. The basic concepts related to the phasor approach (the so-called complex method) are also introduced. A short attention is paid to resonant phenomena (serial and parallel resonance). The third section briefly reviews the transition processes in linear electric circuits of first and second order. The fourth section provides a brief overview of non-linear electrical circuits. The main types of non-linear elements are considered. The DC and AC regimes in non-linear electric circuits are briefly discussed. The fifth section deals with the theory of the electromagnetic devices. Elements of the theory of electromagnetism are presented, and some of the basic laws are introduced. Magnetic circuits are examined, too. The action of the ferromagnetic core transformer is presented. The construction and the operation of some types of electromagnetic devices such as DC motors, asynchronous motors and synchronous micromachines are considered, too.

The course in "Electrical Engineering" is an extension of the course in "Basic Mathematics for Engineers". It provides the next course in "Measurements in Electronics", as well as the courses "Analysis and synthesis of logic circuits", "Computer electronics", "Microprocessor engineering" and others.

CONTENTS:		
Training Area	Hours lectures	Hours seminar exercises

DC regimes in linear electric circuits.	3	3
Harmonic regimes in the time domain.	3	3
Definitions of the effective values of the voltage and the current (the so-called RMS) and for the different types of power	3	3
Basic concepts related to the phasor approach (the so-called complex method)	3	3
Transition processes in linear electric circuits of first and second order.	3	3
Overview of non-linear electrical circuits. main types of non-linear elements	3	3
DC and AC regimes in non-linear electric circuits	3	3
Theory of the electromagnetic devices.	3	3
Magnetic circuits. action of the ferromagnetic core transformer	3	3
Construction and the operation of some types of electromagnetic devices such as DC motors, asynchronous motors and synchronous micromachines	3	3
TOTAL: 60 h	**30**	**30**