



Course: *Electronic Systems of Control and Regulation*

LECTURER: levgen Verbytskyi, PhD

LANGUAGES OF EDUCATION: Ukrainian, Russian, English

THE SUBJECT OF EDUCATIONAL COURSE: The course examines the principles of operation of digital control systems: basic principles of discrete information representation, properties of discrete signals on basis z-transform, Laplace and Fourier transformation, difference equations. Specific features of processing digital signals, given the relationship between a discrete signals and basic type of continues signal representation on basis transform functions and state variables. Studied the principles of synthesis of digital control systems based on PID controllers, optimum controllers, controllers based on state variables for linear systems, linear systems with dead time, nonlinear systems. Described the method of parameters calculation of digital regulators, evaluated their options and made their comparison.

THE GOAL OF THE COURSE IS ACHIEVING OF STUDENTS ABILITIES:

- ❖ obtaining knowledge about common methods for digital control systems design;
- ❖ calculation of control system parameters;
- ❖ simulation of digital controllers.

MAIN TASK OF EDUCATIONAL COURSE

In accordance to demands of educational-professional program, after the finishing of this course must demonstrate such learning outcomes:

Knowledges:

- ✓ calculation discrete transfer functions;
- ✓ analog and digital sensors features;
- ✓ principle of digital regulator synthesis;
- ✓ estimation of control systems effectiveness;
- ✓

Skills:

- ✓ calculation of PID regulator parameters;
- ✓ estimation of digital control systems effectiveness;
- ✓ representation of control system in state variables space;
- ✓ calculation parameters and choosing components of power converters;
- ✓ transformation transfer function in state variable representation.

Experience:

- ✓ design and simulation of digital control systems;
- ✓ implementation control system to power converter design.

COURSE DURATION: 54 hours of lection; 18 hours of laboratory works; 18 hours of practice.

REQUIREMENTS TO STUDENTS: signal analysis theory, power converter theory, and basic mathematical background .

