

MATHEMATICAL MODELING OF PHYSICAL PROCESSES

COURSE SYLLABUS ABSTRACT

Specialty_6-05-0716-03 Information and measuring instruments and systems

	Form of obtaining higher education
	Full-time (daytime)
Course	2
Semester	4
Lectures, hours	16
Practical classes (seminars), hours	16
Laboratory classes, hours	34
Course paper, semester	4
Exam, semester	4
Contact hours	66
Independent study, hours	42
Total course duration in hours / credit units	108/3

1. Brief content of the academic discipline: The purpose of the academic discipline is to teach students general issues of modeling physical processes and the use of these skills in constructing mathematical models when designing devices.

2. Learning outcomes: As a result of mastering the academic discipline, the student should know: methods of mathematical modeling of physical processes of interaction of fields and radiation with objects and environments; methods of mathematical modeling of physical and information processes; mathematical methods for solving real control problems and their capabilities; methods of formalizing the semantic formulation of the problem, selecting analytical methods, compiling a mathematical model and computational algorithms; conditions of interaction of waves and radiation beams with interfaces of media and with local objects; be able to: use standard modeling approaches to obtaining mathematical models of physical processes; analyze and optimize the obtained models; possess: the ability to rationally select methods of mathematical modeling and optimization and their solution.

3. Competencies to be developed: Be able to develop mathematical models of measuring paths and converters of non-destructive testing devices.

4. Requirements and forms of current and midterm assessment: The level of students' knowledge is assessed using various means of competency diagnostics. These are the means of current diagnostics: written tests on problem solving, reports on laboratory work with their oral defense. Midterm assessment (exam) is conducted in two stages. The first stage includes a written answer to questions, which are a selection of questions submitted for the exam. The second stage consists of a short conversation with the student on the fundamental issues of the course.