

## "MATHEMATICAL MODELING OF ENGINEERING FACILITIES AND PROCESSES"

(course title)

### **COURSE SYLLABUS ABSTRACT**

7-06-0714-02 – "Innovative technologies in mechanical engineering"

(specislity code and name)

Mechanical engineering and machine science

Welding technologies

Computer engineering of transport and technological machines

(concentration)

Advanced higher education

	STUDY MODE	
	full-time	part-time
Year	1	1
Semester	1	1
Lectures, hours	16	4
Practical classes, hours	16	4
Exam, semester	1	1
Contact hours	32	8
Independent study, hours	76	100
Total course duration in hours / credit units	108 / 3	

#### **1. Course outline**

The purpose of the discipline is to present to students a range of issues related to the construction of empirical mathematical models of technical objects and systems.

#### **2. Course learning outcomes**

Upon completion of the course, student will be expected to

##### **know:**

- the basic principles of statistical methods for constructing empirical models;
- model quality criteria and measures to ensure them;
- methodological foundations of the experiment;

##### **be able to:**

- evaluate the accuracy of experimental data;
- plan experimental studies, determine factors and output variables of empirical models;
- use the least squares criterion and methods of planning factor experiments to build models;
- evaluate the quality of empirical models;

##### **to possess a skill:**

- possession of computer tools for processing and analyzing research results.

#### **3. Competencies**

Codes of formed competencies	The names of the competencies being formed
UK-1	Apply methods of scientific cognition in research activities, generate and implement innovative ideas
UK-2	Solve research and innovation tasks based on the use of information and communication technologies
UK-4	Provide communication, demonstrate leadership skills, be capable of team building and the development of strategic goals and objectives
UK-5	Develop innovative receptivity and ability to innovate
UK-6	Be able to predict the conditions for the implementation of professional activities and solve professional tasks in conditions of uncertainty
UPK-1	To choose methods of mathematical modeling of technical objects and processes of manufacturing machine parts using computer technology to solve practical problems
UPK-2	Optimize equipment and tooling designs, mechanical assembly production technologies

#### **4. Requirements and forms of midcourse evaluation and summative assessment**

To assess the level of knowledge of students, the following diagnostic tools are used: reports on practical work with their oral defense; passing the exam.