

## Educational work

### COURSE SYLLABUS ABSTRACT

#### Specialty 7-06-0716-03 – " Instrumentation "

	STUDY MODE
	full-time
Year	1-2
Semester	1-3
Practical classes (seminars), hours	150
Course project, semester	4,5
Pass/fail, semester	1,2,3
Contact hours	150
Independent study, hours	174
Total course duration in hours / credit units	324/9

#### 1. Summary of the academic discipline.

2. 1 The choice of the direction of scientific research and an in -depth study of physical phenomena and processes on the basis of which the study is built. 2 Systematization of information, its classification and analysis, identification of characteristic features and contradictions for the motivation of scientific research. 3 Analysis of the object of control, the study of the technology of its manufacture, requirements for the quality of the control object. 4 Analysis of defects that occur during the manufacture and operation of the facility. 5 Determination of the possibility of modeling an object with defects of various types, shape and size. 6 Study of the NC methods and the choice of optimal for mutual orientation of the radiation of the field and object. 7 The choice of optimal control modes. 8 Optimization and selection of informative parameters about defects in the control object. 9 Development of research methods. 10 Development of algorithms, structure and information processing programs. 11 The choice of schemes and the elemental base for the installation for experimental research, determining the modes of its operation, taking into account the rules of safe operation and ergonomics. 12 Preparation for experimental research, planning and organization of the experiment, checking the working hypothesis and its options. 13 The establishment of the nature and degree of exposure to various interference and disturbances on the size and nature of informative features of defects, the experiment. 14 Correction of the program and methodology of experimental research. 15 Conducting experimental research and processing the results; Identification of the correspondence and degree of discrepancy between experimental and theoretical data. 16 Assessment of the quality of the experiment and the formulation of proposals on the causes of inconsistency, the search for physical and mathematical justifications of such discrepancies. 17 formulating approaches to adjusting mathematical models and working hypothesis, formulating conclusions. 18 Registration of research results, preparation and writing of a report (article, report, development of a technical proposal and applying for materials for the alleged invention). Learning outcomes. As a result of mastering the discipline , the student must

**to know:** contradictions for the motivation of scientific research, methods of analyzing the object of control, defects, the methodology for the choice of informative parameters of the control object, the methodology for preparing for experimental research and conducting them, the methodology for processing the results of scientific research and presenting them;

**be able to:** the methodology for the choice of the direction of scientific research, the identification of characteristic features and contradictions for the motivation of scientific research, methods of analyzing the object of control, defects, the methodology for the choice of informative parameters of the control object, the methodology for preparing for experimental research and conducting them, the methodology for processing the results of scientific research and presenting them;

- **have skills:** settings and operation of devices and devices of non -destructive control and diagnostics; an idea of the types and methods of forming requirements for parameters, equipment and the preparation of regulatory documentation; The idea of such concepts as the detection of defects, sensitivity, the resolution of various methods of non -destructive control (NK).

3. Formed competencies. CK-4 - Plan and conduct an applied nature research work.

4. Requirements and forms of current and interim certification.

4.1. Performance of tests and their protection.

4.2. Performance of tests.