

DEVELOPER Abstract: Professor of instrumentation, professor Elena Bezvesilna  
Summary of discipline Scientific Research in the Field of Mechanical Quantities  
Measurement SUMMARY OF DISCIPLINE

Discipline "Research on the measurement of mechanical quantities" prepared in accordance with the educational and vocational training programs for master direction 6.05100306 "Instrument". The cycle, which belongs to the subject matter: professional and practical training. The subject of the discipline: research on measurement of mechanical quantities

The list of disciplines to ensure and provide

Discipline is based on the students' knowledge of these disciplines: physics, higher mathematics, computer modeling, the course of physics, metrology, electrical engineering, electronics, Theoretical and Applied Mechanics; automatic control theory; Materials and construction materials, engineering and computer graphics, chemistry, technical mechanics, measurement of acceleration; Automated measuring complexes; designing instruments; weighing machines; microprocessors in measuring instruments; CAD measurement tools. Discipline Program provides basic information about the presentation of the latest achievements of domestic and foreign scholars in the field of scientific research in the measurement of mechanical quantities.

The purpose of the discipline is to develop the students' skills: the use of modern methods of research and development of the theory and principles of construction of high-precision computerized electro-mechanical measuring systems, research and development of mathematical models of electromechanical measuring systems (EIS), the study of static, tools, dynamic and systematic errors in the case of random vibration base on how to combat interference, including the fundamental noise, method of filtering noise.

The main tasks of the discipline:

- to present the basic information required for the theoretical and practical study of the discipline of lectures;
- to present the basic information required for the acquisition of skills and skills in using modern experimental techniques in the measurement of mechanical quantities;
- reveal professional, methodical focus discipline, its relationship with other disciplines specialty.

The students in the study of such subjects acquire knowledge:

- philosophical problems of discipline,
- main trends and prospects of the development of instrumentation, test and measurement equipment, advanced experimental techniques in the measurement of mechanical quantities,
- Mathematical methods for solving problems of discipline specialty,
- methods for the development of self-study material of lectures and study the technical literature,
- methods of research in the discipline,
- method of election of appropriate methods of experimental research and mathematical processing of the data on a computer, depending on the task,
- subject of the discipline and its role in the qualification of the expert;

Skills:

- possess rational methods of finding and using scientific and technical information on research in the measurement of mechanical quantities,
- use of modern computer technology in the implementation of the experimental methods for measuring mechanical quantities
- Conduct research on the measurement of mechanical quantities,
- to perform all the necessary calculations in the implementation of scientific research in the measurement of mechanical quantities,
- make their own decisions, to choose the criteria and methods of optimization of parameters and optimize the introduction of scientific research in the measurement of mechanical quantities,
- use of modern mathematical tools and computers for solving engineering problems of experimental methods for measuring mechanical quantities.

experience:

- carry out scientific research in the field of instruments and instrument systems,
- use methods of scientific research instruments and instrument systems, methods of election of the instruments and instrument systems and mathematical treatment of the data on a computer, mathematical methods for solving problems in the specialty, methods of independent work for the development of materials of lectures and study the technical literature,
- use the latest technologies (nanotechnology, the device of neural networks,

wavelet analysis, etc.) for research instruments and instrument systems.