

Summary of discipline Metrology

Introduction. The program of the course "Metrology" drawn up in accordance with the educational and vocational training programs for bachelor direction (specialty) 6.051003 Instrument.

Academic discipline belongs to the series "Disciplines of Professional and Practical Training"

The object of the course is

- Metrological basis and methods of forming the specific requirements for precision manufacturing and installation of functional relationships between different parts of measuring devices;
- Studying the metrological characteristics of instrumentation, methods of calculation errors and ways to improve the information capacity measurement tools;
- Basis for the unity of measurement, metrological provision of production;
- The structure of the metrological service, its main structural elements and tasks.

Academic discipline based on previously studied courses, namely:

Mathematics: mathematical analysis, probability theory, mathematical statistics, set theory, programming, mathematical modeling, algorithmic.

Physics: mechanics, vibrations and waves, gases, electromagnetic phenomena, geometrical optics and interference of light, linear expansion of bodies when heated.

Theory of mechanisms: transmission, friction, static and dynamic characteristics of mechanisms.

Details devices, connections, transmission characteristics of strength, limit load.

Descriptive geometry and instrument drawings, unified system design documentation.

Strength of Materials: Fundamentals of theory of stress and strain states, dynamic performance and stability parameters beams, rods, covers different forms. Materials, construction materials, their properties, strength characteristics dependent on application conditions.

At the presentation of the above sections of General disciplines should be linked with questions of demands to the elements of devices, integrated approach to systemically provide a high level of scientific and technological development of devices. Systematic approach to teaching provides optimal decision making when determining the required properties of materials used, structural and circuit design, rational unified decision-making.

1. The purpose and objectives of the course

1.1. The purpose of discipline.

The aim of the course is to develop students' abilities:

- The application of a single international system of units of measurement;
- Determination of metrological characteristics of instruments and measurement systems and methods of their calculation;
- Determination of errors of measurement tools, methods of calculations and ways to decrease;
- Processing of measurement results and detection of errors;
- Carrying out metrological certification of measurement;
- Analysis of metrological support of production.

1.2. The main objectives of the course.

Requires educational and professional program students after mastering discipline must demonstrate the following learning outcomes:

knowledge:

- The theory of technical measurements;
- Building measurement features and their metrological characteristics;
- The basic forms of conversion measurement signals;
- Means of measurement errors, their causes and methods to reduce errors;
- The methods of calculation errors;
- Measurement theory;
- Metrological certification of measurement;
- Metrological support of production.

the ability to:

provide metrological support of technological processes of production devices and their components; apply the methods of measurement and research options products; conduct research and measuring parameters of products; own selection methodology of measuring and processing of results.

experience:

these should be associated knowledge and skills within an integrated system

approach to ensure a high level of scientific and technological development of devices. The systems approach provides optimal decision making, including structural and circuit design, based on analysis of metrological characteristics in the creation of modern means of measurement.