Course Description

Discipline/Course: Computer technologies in science and education

The Basic Educational Program specialty: MECHANICAL ENGINEERING

The department of physics of high technology in mechanical engineering
Instructor: Svetlana N. Sorokova, PhD
Contact details: +7 3822 600, email: s_sorokova@tpu.ru

Learning Outcomes:

The discipline focuses on acquisition of practical training the students in the problem solving:
Knowledge at the level of ideas: the role and place of knowledge on the subject " Computer technologies in science and education" during the development of related disciplines in the field of professional activity;
at the level of reproduction:

- master the terminology used when working on the PC

at the level of understanding:

- the objectives and tasks bases computer technology, the role and importance of computers in today's society

Theoretical skills: know the possibility of application software packages;
Practical skills: Apply the possibility application software packages for solving problems of engineering technology.
Skills: work with applications CAE system.

Course Outline:

Section 1. Introduction to the discipline.
Section 2. Computer-aided programming equipment with numerical control. General information on computer-aided programming of CNC equipment. Basic concepts. Computer-aided programming.
Section 3. Basics of programming in MatLab.
Section 4. The basics is programming in Delphi. OOP in Delphi.

Practice 1. The use of modern computer-aided programming.
Practice 2. Perspectives for the development of computer technology and industrial systems.
Practice 3. Methods of computer modeling and design in the manufacture of innovative products.
Practice 4. Examples of programming in MatLab.
Practice 5. Examples of programming in Delphi.

Lab 1. Working with the Compass 3-D. Menu. Toolbar.
Lab 2. Working with the Compass 3-D. Create an assembly drawing details.
Lab 3. Work in an environment MatLab. Menu. Toolbar.
Lab 4. Work in an environment MatLab. Application development.
Lab 5. Working in Delphi. The basics of object-oriented programming.
Lab 6. Working in Delphi. Standard and sample dialogues, multi-notebooks.

Lab 7. Working in Delphi. The graphics in Delphi.

Course Delivery: one semester, 18 weeks

Prerequisites: “Information science”, “Mathematics”, “CAD/CAM systems”, “Mathematical Methods in Engineering”

Co-requisites: “Elements of the elasticity theory, vibrations and vibration mechanics”, “Artificial intelligence, experimental systems and knowledge base in engineering”, “Technology of special alloys production”, “Mechanical Engineering Technology”

Final Assessment: pass/fail test

Course Developer: Svetlana N. Sorokova, PhD