

Course Description

Discipline/Course: Dimensional analysis of constructive units

The Basic Educational Program specialty: MECHANICAL ENGINEERING

The department of high technology physics in mechanical engineering

Instructor: Egor A. Efremkov, PhD

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Learning Outcomes:

This course introduces the student to the concepts of design dimension chains, also types and methods of its calculations. Students also get basics on building of dimension chains and calculation;

at the level of reproduction: master the terminology used when working with the dimensions and dimension chain

at the level of understanding: the objectives and tasks bases dimensional analysis, the role and importance of dimension chains analysis

Theoretical skills: know the several ways to calculate dimension chains;

Practical skills: apply the possibility obtaining of unknown dimension in the chain.

Skills: to project a good constructions.

Course Outline:

Section 1. Main Conceptions and Statements.

Section 2. Basic Equations of Dimension Chains. Definition of Dimension Chains.

Section 3. Methods for accuracy is achieved of closing links.

Section 4. Achieving of closing links accuracy by deference methods.

Section 5. Links like position deviations of surfaces.

Practice 1. Building of dimension chain for line dimensions.

Practice 2. Building of dimension chain for angle dimensions.

Practice 3. Calculation of dimension chain by full interchangeability method.

Practice 4. Calculation of dimension chain by not-full interchangeability method.

Practice 5. Calculation of dimension chain by sectional interchangeability method.

Practice 6. Building of dimension chain for assemblies.

Practice 7. Calculation of dimension chain for assemblies.

Course Delivery: one semester, 18 weeks

Prerequisites: “Mathematics”, “Descriptive geometry”, “Fits and clearances”

Co-requisites: “Details of machines and basis of designing”, “Technology bases”

Final Assessment: pass/fail exam

Course Developer: Egor A. Efremkov, PhD