



RTU Course "General Metrology"

15513 Aparātu būvniecības katedra

General data

Code	MAB215
Course title	General Metrology
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Undergraduate Studies
Course type	Academic
Field of study	Mechanics, Mechanical Engineering, Machine Building
Responsible instructor	Rudzītis Jānis
Academic staff	Šīrons Edgars Grīņevičs Ivans
Volume of the course: parts and credits points	1 part, 3.0 Credit Points, 4.5 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Not planned
Abstract	Basic terms, metrological characteristics of instruments, evaluation of measurements, errors, error types. Dimensions, their precision and fits.
Goals and objectives of the course in terms of competences and skills	Acquire skills to select measurement tools and take measurements according to precision of the given parts. Gain knowledge and practical skills in calculation methodology of mate fits.
Structure and tasks of independent studies	Independently execute and prepare laboratory work and study work.
Recommended literature	1. Šīrons E., Rudzītis J., Odītis I. Vispārīgās metroloģijas pamatkurss. Mācību grāmata. Rīga, RTU, 2008 - 227 lpp.; 2. Šīrons E. Detaļu ģeometrisko parametru mērīšana. Mācību grāmata. Rīga, RTU, 2007 - 340 lpp.; 3. Čudinovs V., Rudzītis J. Vispārīgā metroloģija. Laboratorijas darbu praktikums. Rīga, RTU, 2008 - 146 lpp.; 4. Kumermanis M., Rudzītis J., Šīrons E., Fiļipovs A. Salāgojumi un izmēru ķēdes. Studiju darbs disciplīnā "Vispārīgā metroloģija". Rīga, RTU, 2009 - 84 lpp.
Course prerequisites	Basic knowledge of technical drawing, physics, mathematics.

Course outline

Theme	Hours
Basic concepts and definitions of deviations and tolerances.	4
Surface profiles and positional variations.	4
Systems of limits and tolerances.	4
Calculation of dimensional tolerances.	4
Frontal measures.	4
Choices of universal measuring instruments and their justification.	4
Types of measurement errors.	4
Assessments of error probability.	4
1. Lab.w. Sliding calipers.	2
2. Lab.w. Apparatus and measuring instruments for measuring profiles and positional variations.	2
3. Lab.w. Smooth micrometer.	2
4. Lab.w. Vertical optical gauge.	2
5. Lab.w. Determination of size scatter nature for series of parts.	2
6. Lab.w. Bore meter.	2
7. Lab.w. Roughometer - profilometer.	2
8. Lab.w. Electrical contact sorting machine.	2

Learning outcomes and assessment

Learning outcomes	Assessment methods
Student must know and use the selection criteria for fits with guaranteed clearance, with guaranteed interference and transition fit.	Properly chosen fits for given task in study work.
Student must be able to calculate fits with guaranteed clearance, with guaranteed interference and transition fit.	Correctly calculated fits for given task in study work.
Student must know classification of dimension chains and must be able to use various solving methods for dimension chains.	Correctly calculated tolerances and limit deviations for compose members of dimension chains in accordance with given limit deviations of exit (concluding) member in study work.

Student must be able to calculate, choose, and practically use control and measurement techniques and tools for geometric parameters of products.	Properly carried out choice of preferred measuring tool for measuring internal and external dimensions in study work.
Student must be able to graphically depict fits, tolerances and limit deviations of calculated mates.	Graphical part of study work is drawn up according to standard.

Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	3.0	4.5	1.0	0.0	2.0		*	