Fundamentals of Mechanical Engineering

Course Overview for gr. 158Л3А

Level of study	**Bachelor Degree**
Workload	**ECTS: 6** **Total Hours: 171** **Contact Hours: 72** • **Lectures: 32** • **Labs: 24** • **Seminars: 16**
Course Code	Б3.Б10
Semester	**Summer**
Prerequisites	*Structural Materials Engineering, Metrology, Standardisation and Certification, Materials Science, Material Cutting and Cutting Tools*
Course Objectives	*The objective of the course is to acquire knowledge, skills and experience in the field of analysis and design of the manufacturing processes*
Learning Outcomes	*Will be able to:* • *choose methods of workpiece production;* • *assign tooling for product manufacturing;* • *carry out statistical analysis of machining accuracy;* • *perform tolerance analysis of the manufacturing processes;* • *carry out statistical analysis of machining accuracy;* • *design processes of parts production.*
Syllabus	*1. Introduction to Mechanical Production* *2. Tolerance stack-ups and part location* *3. Accuracy of manufacturing* *4. Surface layer quality and material properties requirements* *5. Production process effectiveness* *6. Fundamentals of production process design*
Labs	*1. Industrial investigation of a lathe rigidity* *2. Statistical analysis of machining accuracy* *3. Measurement of thermal deformation of a cutter in finish turning* *4. Effect of cutting parameters and diamond burnishing on surface finish* *5. Analysis of the ring manufacturing accuracy*
Projects	
Assessment	*Exam*
Resources	• *Fundamentals of Mechanical Engineering/ V. F. Skvortsov; Tomsk Polytechnic University (TPU). — Tomsk: Tomsk Polytechnic University Publishing House, 2014. (http://www.lib.tpu.ru/fulltext2/m/2014/m255.pdf)* • *Manufacturing Engineering and Technology. Fifth edition. Serope Kalpakjian, Steven R. Schmid, 2006* • *Shigley, Joseph E. Mechanical Engineering Design / J. E. Shigley, C. R. Mischke. — 6 Edition. — New York : McGraw-Hill, 2001. — 1248 p. : il. — Index: p. 1237-1248. — ISBN 0-07-365939-8.*
Instructors	*Kim Alexey Bogowhich* *http://portal.tpu.ru/SHARED/b/BOGOWHICH*