**Fundamentals of Mechanical Engineering**

**Course Overview**

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| **Level of study** | **Bachelor Degree** |
| **Workload** | **ECTS: 3**  **Total Hours: 108**  **Contact Hours: 36**   * **Lectures: 12** * **Labs: 16** * **Seminars: 8** |
| **Course Code** |  |
| **Semester** | **Winter or 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** | 1. *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*](http://www.lib.tpu.ru/fulltext2/m/2014/m255.pdf)*)* 2. *Manufacturing Engineering and Technology. Fifth edition. Serope Kalpakjian, Steven R. Schmid, 2006* 3. *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* |