

# Geometric Product Specifications (6029-M)

5 ECTS

**Lecturer:** R. Kunc, S. Zupan

Lectures: 30h

| Tutorials: 22h

| Labs: 8h

| Project: 0h

| Lang. :



## Objectives

1. Gaining theoretical and practical knowledge in the field of detailed geometrical product specifications (GPS).
2. Understanding principles and rules of standardized Geometrical Dimensioning and Tolerancing (GD&T) systems and their practical use.
3. Understanding statistical geometrical tolerances and statistical control of production processes and practical use.
4. Understanding and developing geometrical tolerance analyses (TA) and practical use.
5. Understanding and development of specialized software tools (GPS, GD&T, TA).

## Programme

Lectures :

Introduction and basic definitions of GPS according to ISO standards. General GPS principles and rules, specifications on virtual (3D) models and on technical drawings (2D).  
What is Geometrical dimensioning and tolerancing (GD&T) and why to use it. Datums and datum systems (i.e. references). Geometrical tolerances (GT) definitions and practical use – form, orientation and location tolerances. Runout and Profile geometrical tolerances. Material conditions of GT, meaning and use.  
Methods of geometrical tolerance (GT) verification and tolerance analyses (TA). Statistical tolerances (ST). State of technical surfaces and edges. Adding GPS in 3D virtual models (Model Based Definition) and transmission into technical documentation (2D). Product Data Management (PDM) and Product Lifecycle Management (PLM) systems and software...

## Prerequisites

In order to successfully achieve this course, the students must have:

Meeting the enrolment conditions for the Master's study program of Mechanical Engineering - Research and Development program.

## Learning outcomes

After attending this course, the student will get in-depth theoretical, methodological and analytical knowledge with elements of research, which is the basis for demanding specialist work skills:

- Know how to interpret complex technical drawings and 3D models with added GPS symbol information and produce complex technical drawings and complete 3D models with standardized symbols and indications/attributes. Know and understand complex concepts and rules of tolerancing (GD&T) and surface and edges states marking.
- Understand and know how to use theoretical backgrounds and methods for conducting linear geometrical tolerance analyses (TA) and understand and know how to use software tools for complex spatial tolerance analyses.
- Understand the role and meaning of complex rules of technical documentation and the importance of those rules for functionality.

## Assessment

- Theory examination (written/oral): 50%,
- Practical examination in laboratory (written/oral): 20%,
- Project (home) work (written): 30%.

## Literature

1. Henrik S. Nielsen, The ISO Geometrical Product Specifications Handbook (2<sup>nd</sup> ed.), ISO/Danish Standards 2024, ISBN: 978-92-67-11040-4 (print), ISBN: 978-92-67-11041-1 (PDF-DRM)
  2. Stefano Tornincasa, Technical Drawing for Product Design, Mastering ISO GPS and ASME GD&T, 1st ed. 2021, Springer, ISBN 978-3-030-60853-8, e-ISBN 978-3-030-60854-5
- Additional:
3. ZUPAN, Samo, KUNC, Robert, ŽEROVNIK Andrej.: Geometric Product Specifications (GPS); Geometric Tolerances (definitions) and analyses (GTA); study material (subject online classroom) / university textbook in preparation (SLO / EN language)