

I. Personal and study details

Student's name: **Bartoš Filip** Personal ID number: **467317**
Faculty / Institute: **Faculty of Mechanical Engineering**
Department / Institute: **Department of Production Machines and Equipment**
Study program: **Mechanical Engineering**
Branch of study: **Production Machines and Equipment**

II. Master's thesis details

Master's thesis title in English:

Effective Control of CNC Milling Machine Tool when Machining Complex Parts

Master's thesis title in Czech:

Efektivní řízení frézovacího CNC stroje při obrábění tvarově složitých dílců

Guidelines:

Topic description: The student will work on an algorithm for dynamic control of technological conditions in machining of complex parts, combining two approaches with respect to machine tool CNC control: a) speed control to achieve a constant cutting speed, b) feed-rate control with respect to the angular velocity. Syllabus of work: A) Overview of the state of the art in the field of dynamic control of techn. conditions in multi-axis machining. B) Search for parameters and characteristics of CNC milling machines influencing the possibilities of using dynamic speed and feed-rate control. C) Proposal of solution variants. D) Creation of an algorithm for feed-rate correction. E) Implementation of the algorithm into the postprocessor. F) Proposal and realization of machining tests with dynamic control of tech. conditions. G) Analysis of the effects of dynamic control of technology conditions on productivity and roughness of the machined surface.; Extent of the text part: 60 - 80 pages; Scope of the graphic part: selected flowcharts.

Bibliography / sources:

SOUČEK, P.: Servomechanismy ve výrobních strojích. 1. vydání. Praha: ČVUT, 2004. 210 s. ISBN 80-01-02902-6.;
VAVRUŠKA, P.: Technologické nadstavby postprocesorů pro víceosé CNC stroje. Praha, 2013. Disertační práce na ČVUT v Praze. Fakulta strojní. Ústav Výrobních strojů a zařízení.; Li, J., Kilic, Z. M., Altintas, Y.: General Cutting Dynamics Model for Five-Axis Ball-End Milling Operations. ASME. J. Manuf. Sci. Eng. 2020; 142(12): 121003.

Name and workplace of master's thesis supervisor:

Ing. Petr Vavruška, Ph.D., Department of Production Machines and Equipment, FME

Name and workplace of second master's thesis supervisor or consultant:


Ing. Tomáš Kozlok, TOS VARNSDORF

Date of master's thesis assignment: **21.10.2021** Deadline for master's thesis submission: **03.01.2022**

Assignment valid until: **20.02.2022**


Ing. Petr Vavruška, Ph.D.
Supervisor's signature

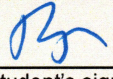

Ing. Matěj Sulitka, Ph.D.
Head of department's signature


prof. Ing. Michael Valášek, DrSc.
Dean's signature

III. Assignment receipt

The student acknowledges that the master's thesis is an individual work. The student must produce his thesis without the assistance of others, with the exception of provided consultations. Within the master's thesis, the author must state the names of consultants and include a list of references.

31.10.2021
Date of assignment receipt


Student's signature