

I. IDENTIFICATION DATA

Thesis title:	3D Printing of Electrical Machines
Author's name:	Bc. Mohamad Ghaith Almasri
Type of thesis:	master
Faculty/Institute:	Faculty of Mechanical Engineering (FME)
Department:	Department of Instrumentation and Control Engineering
Thesis reviewer:	Ing. Milan Navrátil, Ph.D.
Reviewer's department:	Tomas Bata University in Zlín, Faculty of Applied Informatics, Department of Electronics and Measurement

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment	Choose an item.
<i>How demanding was the assigned project?</i>	
3D printing of electrical machines is very broad topic. Generally, it requires a solid understanding of electrical engineering, electromagnetics, and mechanical design as well as the principles of machine design, motor operation, and electrical circuits. In the thesis, there is no assignment, so it is hard to determine the difficulty of the work by the title alone. I leave it to the supervisor to judge.	

Fulfilment of assignment	Choose an item.
<i>How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.</i>	
I can't objectively judge the level of accomplishment of the work because of missing assignment. I leave it to the supervisor to judge.	

Methodology	correct
<i>Comment on the correctness of the approach and/or the solution methods.</i>	
By studying the thesis and especially chapter 6, I get an idea of what the student has created and what he has aimed for. Used methods were correctly chosen, but the way how the solution is presented is not good.	

Technical level	F - failed.
<i>Is the thesis technically sound? How well did the student employ expertise in the field of his/her field of study? Does the student explain clearly what he/she has done?</i>	
The student has demonstrated the ability to work with literature and employed expertise in the field of his study. Literature review is on a good technical level. Anyway, the practical part of the thesis does not fully correspond to the literature review and some chapters are in insufficient quality. The very title of chapter 3.4 "Microcontroller Circuit Design and Wiring" evokes in the reader that you created the PCB design including the wiring yourself. However, the following short description shows that you used a ready-made solution. Chapter 4 "Experimental Work" contains only single one photo of measuring workplace without any text. I strongly miss some measurement scheme, more detailed illustrations, and the description of used experiments. In the chapter 5 "Results and Discussion", there are 13 charts with a very brief description but no discussion.	

Formal and language level, scope of thesis	F - failed.
<i>Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?</i>	
The work is formally incorrect. The assignment, abstract and keywords are totally missing. Some images are blurry, or font size is often small resulting in unreadable text in images (e.g. Fig. 1 - 3). List of symbols and abbreviations is not complete (e.g. AM, EM, UV, DC, BCB, SLA, LOM, ASTM, LVDT and many others). Student could present his work and results in much better way.	

Selection of sources, citation correctness**B - very good.**

Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?

Literature was properly chosen regarding the topic of the thesis. The range of information sources corresponded to the requirements set for the master thesis. References to the sources are given in the text and figures. I appreciate utilization of articles from many technical journals.

Additional commentary and evaluation (optional)

Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.

The thesis includes a good quality literature review followed by design and implementation of a dual paste extruder for an existing 3D printer. These parts of the thesis were clearly described in detail and technically correct. Some of the next chapters, dealing with experimental activities, measurements, data evaluation, discussions, etc., were written very briefly and often had insufficient quality.

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

Summarize your opinion on the thesis and explain your final grading. Pose questions that should be answered during the presentation and defense of the student's work.

The topic of the thesis is interesting and current, but the formal aspect of the thesis degrades all the effort the student has put into this work.

Additional questions:

1. What is the difference in energy efficiency between a classic transformer and the one you created using a 3D-print?
2. Why does not the thesis contain assignment, abstract and keywords?
3. Why does the Chapter 4 called "Experimental work" contain just one photo without any description or comment?
4. The Chapter 5 is called "Results and discussion" but the reader finds no mention or attempt to comment or discuss anything. Please, can you comment, and defense mentioned imperfections?

The grade that I award for the thesis is **F - failed**.

Date: **12.6.2023**

Signature: Milan Navrátil, v.r.