**COURSE 12: ADDITIVE MANUFACTURING FOR INDUSTRY 4.0**

Team: …………………………………………………………………………………………………………………………………………………

Student’s name: …………………………………………………………………………………………………………………………………

**Worksheet 7.1 – LABORATORY 7**

This worksheet is provided to you so that you can register the progress of specific activities throughout the implementation of Laboratory 7.

1. **Briefly describe the structure of your complex assembly. Mention the topics you used from previous laboratories. Write down which teammate is in charge of each sub-assembly and manufacturing task.**

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1. **Provide the hand drawn sketch of your concept product, identifying the main components of the assembly (at least 8 moving parts). Mention the main design rules which apply when printing your complex assembly components. Identify the general function of the assembly. Identify the functional surfaces.**

PRODUCT CONCEPT SKETCH

**Design rules**

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**General function of the assembly**

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**Functional surfaces (number them in the sketch)**

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1. **Mention the main CAD steps for each of the designed components. Specify the assembly procedure for the virtual test and fit.**

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1. **Specify the characteristics of your STL files for each component. Mention if you had any mesh errors and how you fixed them.**

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1. **Mention which 3D printing parameters you adjusted during optimization and how they influenced your build.**

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1. **Specify if the equipment required any specific preparation or maintenance procedures.**

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1. **Write down if your print required any additional adjustments (e.g. if you had printed fails and how you addressed them) and justify why.**

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1. **Mention if the removal of your parts or the post processing procedures were according to guides or if you performed any additional steps. Write down any problems you encountered during these stages and the measures you took to solve them.**

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1. **While assembling and testing of your manufactured product, write down any flaws or inconsistencies. Break them down into three main flaws/ fails categories: bad design; improper printing parameters; inadequate equipment calibration & maintenance.**

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1. **Summarize the results you obtained during Laboratory 7 and propose improvement paths.**

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1. **Complete the following task:**
* **Task 01:**

Calculate the delivery time and material costs for a 100-part batch of products. You should consider the production planning of your own manufactured complex product.

Make sure you take into consideration:
 - optimisation of build plate layouts for each component
 - manufacturing times
 - design and optimisation time
 - post processing time
 - assembly time
 - maintenance routines
 - unplanned machine fails

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