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

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

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

**Worksheet 3.1 – LABORATORY 3**

This worksheet is provided to you so that you can register the progress of specific activities throughout the implementation of Laboratory 3.

1. **Briefly describe the structure of your functional gear assembly. Specify what gear type you used and justify your selection.**

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1. **Provide the hand drawn sketch of your assembly, identifying its main components (at least 2 moving gears). Mention the main design rules which apply when printing your functional gear assembly.**

PRODUCT CONCEPT SKETCH

**Design rules**

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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. Justify the differences in mesh parameters.**

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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 your product required several build plate layouts and justify the parts orientations on the machines’ build plate. Corelate the justifications with part and surface functions.**

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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 functional gear assembly, 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 3 and propose improvement paths.**

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1. **Complete the following task:**

* **Task 01:**

Based on the case study given below, summarise the operational characteristics of ABS versus PLA 3D printed cylindrical gears.

The case study is available at: <https://3dprint.com/232233/comparing-operational-characteristics-of-plastic-3d-printed-spur-gears/>.

**ABS:**

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**PLA:**

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**Case study conclusion:**

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