

 OSTİM TECHNICAL UNIVERSITY

**2023-2024 SEMESTER**

**GRADUATION PROJECT PROPOSAL FORM FOR MECHANICAL ENGINEERING DEPARTMENT**

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| **Lecture Code: MEC 400** | **Lecture Name: Graduation Project** |
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| **Project Title / Number of Students:** | **Effect of heat treatment (T6) on Turning of Al2024 alloy / Al7075 alloy using Taguchi -Grey Relational Analysis** / 1 student |
| **WORKS AND PROCEDURE TO BE DONE IN THE PROJECT****(Put the item number on the left and write it in order)** |
| **Item**1. Literature review will be performed on the effect of heat treatment on machining on Al alloys.
2. It is novel approach for the optimization of machining parameters on turning of Al2024 and Al7075 alloy with multiple responses based on orthogonal array with grey relational analysis using uncoated carbide insert under dry cutting condition.
3. Cutting parameters such as cutting speed, feed rate, depth of cut and insert radius will be optimized with considering the multiple responses such as surface roughness (Ra), roundness (Ø) and material removal rate (MRR). In order to accomplish this, grey relational analysis(GRA) is employed.
4. Taguchi’s L9 orthogonal array will be selected to design the experiments with three/four factors with three levels, and later on combined with GRA.
5. Optimum parameters will be identified based on the values of GRA. To validate the test result, confirmation test is performed using few more samples.
6. Analyze of variance will be conducted to determine the significant parameters on the multiple performance characteristics and comparisons are also made with un-treated and heat treated samples using the same cutting inserts.
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| PROJECT AIMS |
| **Item**1. To understand the turning process (lathe machine) and Al alloys as mechanical components.
2. To design the experimental work in a systematic way using a Taguchi approach by reducing cost.
3. To optimize the machining conditions for untreated and treated Al alloy samples.
4. To analyze the experimental results based on the analysis of variance (ANOVA).
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| **THE STUDENT TO WORK ON THE PROJECT** |
| Number | Name Surname | Signature |
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| **SUPERVISOR** |
| TitleProf.Dr. | Name SurnameYusuf ŞAHIN | Signatureysahin |