

ME420 Mechanical Engineering Individual Research Project

PROJECT SELECTION FORM

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Reg no. : E/20/388

Name of Supervisor/s : Dr. Lalith N. Wickramarathna

Title of the project : Design of a turbulence generator for limnological studies

Scope of the project (what exactly is to be done in the project):

The scope of this project is limited to the design, fabrication, and experimental validation of a small-scale turbulence generator suitable for limnological studies in a laboratory flume. The work will include a review of existing laboratory-scale turbulence generation methods and the identification of key design requirements relevant to limnological applications. Based on this review, a mechanically feasible turbulence generator will be designed and modeled using CAD tools, followed by the fabrication of a prototype using available workshop facilities. The performance of the prototype will be evaluated through deployment in a laboratory flume to assess its ability to produce controllable and repeatable turbulence. The project will focus on fluid mechanical performance and practical usability; detailed limnological experiments are outside the scope of this study.

Expected final outcome (what is the expected end result):

A designed, fabricated, and experimentally validated small-scale turbulence generator suitable for limnological studies.

Important milestones hoping to be achieved (which should be measurable) during the project:

1. Completion of a comprehensive literature review on small-scale turbulence generators and limnological turbulence requirements.
2. Identification of design requirements and selection of an appropriate turbulence generation concept.
3. Development of a detailed mechanical design and CAD model of the proposed turbulence generator.
4. Completion of prototype fabrication using available workshop facilities.
5. Successful installation and deployment of the prototype in a laboratory flume.
6. Experimental testing and measurement of turbulence characteristics to evaluate performance.
7. Analysis of experimental results and validation of the prototype against design objectives.

8. Submission of the final project report/Article and presentation of findings.



Signature of student

Signature of supervisor

Name of Supervisor:

Date:



22/12/2020