ME325: Mechanical Engineering Group Project

Aim(s): To provide the students with the opportunity to collectively solve a real world complex Engineering problem as a member of a group. At the end of the course all students are expected to value the importance of problem formulation, justification, teamwork, project planning, and technical communication so that they will be able to fit into a team working professional environment.

Intended Learning Outcomes:

On successful completion of the course, the students should be able to;

ILO1: technically formulate an Engineering problem
ILO2: acquire and generate new knowledge
ILO3: productively work in a team using proper project management methods
ILO4: communicate professionally to effectively market their solution.

Module outline

- Identification and technical formulation of solving an engineering problem
    - identification of several viable solutions
    - selection of a suitable solution based on available resources
    - propose a sound project plan optimizing team-work
- Acquisition of new knowledge necessary for solving the problem
- Implementation of the solution
    - Overall quality and completeness
    - Execution of the project plan
    - Innovation/Creativity

Procedure:

- A GitHub repository will be maintained for each project in the organization https://github.com/UoP-ME325-2024. Each project group member and the project supervisor (if on GitHub) will be added to the repository as collaborators. Milestones and timeliness will be maintained and tracked using the project tool in GitHub.
- Student groups will have twice weekly discussions with a supervisor assigned to the group. Each student will maintain a record of the outcomes of these meetings and will be made available on the GitHub project repository. During these meetings the students will report their progress and discuss future activities and envisaged difficulties.
- Each student will be required to maintain a diary in the GitHub project repository that they will use to record the chronological sequence of activities and material gathered regarding the project. This diary will be part of the final evaluation.
- A formal project proposal presentation (plus a short written report) will take place in the third week. In the proposal the students are expected to present their:
    - scientific formulation of the problem,
    - investigation of several possible solutions,

    - the justification of the intended solution using preliminary rough calculations and simulations/experiments,
    - outline of the methodology and
    - the comprehensive project plan.
- The students will then be required to provide further detailed justification of their solution using detailed calculations /simulations/experiments. This stage should involve a certain amount of theoretical knowledge gained.
- A midterm demonstration will take place in the 7th week where student progress will be assessed based on meeting targets, quality of work, extent of knowledge gain, outline of future directions, and soundness of reasoning.
- Once all the theoretical details of the solution have been satisfactorily worked out the students will produce detailed structural/component drawings related to their solution.
- Each group will submit the draft version of the final report to the project coordinator on the 12th week. The draft will be assessed and corrected if necessary by the supervisor and handed back to the project group by the 13th week.
- By the time of the final evaluation the solution should be ready to be implemented.
- The final evaluation will be based on a YouTube video presentation, powerpoint type presentation, a digital poster, a written report and an in person demonstration.

Mode of Assessment:

Apart from the continuous assessment component carried out by the project supervisor, there will be three stages of assessment: the initial written project proposal, the mid-term progress demonstration and the final report, the diary and final demonstration.

Table 1: Overview of evaluation rubrics for project evaluations

Evaluation #	Agenda	Assessment	Allocated weightage for each evaluation
Evaluation 1	Proposal Evaluation (Report)	Rubric R1	10%
Evaluation 2	Mid-Term Evaluation (Pres.)	Rubric R2	30%
Evaluation 3a	End Semester Evaluation (Pres.)	Rubric R3a	30%
Evaluation 3b	End Semester Evaluation (Report)	Rubric R3b	30%
Total			100% (100)