**MPEP MET Assignment 2 Guide to assist students: Report - Outline:**

**Last updated on 10 March 2025**

* cover page (this entire submission covers P4)
* table of contents
* list of tables and figures
* repeat statement of engineering problem and relation to theme (DIGITILISATION for 2023-2024)
* preliminary research (at least 20 secondary sources (textbook, newspaper article, website, journal, thesis or dissertation, magazine article, video, etc should be used to develop a literature review which is a review of all the secondary sources of information, discussing them in groups or themes) this is your analysis of your secondary research. Develop simple **objectives tree** chart and show use of **morphology chart** and expanding or contracting design space to optimize solutions available – to be covered in week 9-11. Secondary research = preliminary research = literature review
* Progress Reports (mandatory tracking Gantt charts and non-mandatory logbooks) P3. Screenshot each progress report chart for each progress report date.
* Explore alternative methods to monitor and meet project milestones. Discuss (what it is and how it will help you) the different methods (PERT, critical path method and Gantt charts) as well as the future of project management tools such as onproject.com, WorkLenz or Microsoft Project Online etc.) for M2 in Lecture 7.
* Project execution phase for acquisition of primary sources - questionnaire design and method of analysis. Use Google forms to prepare and issue link to an online survey to 5-10 persons with subject matter expertise or your classmates. **Lecturer assisted by issuing survey separately for EEET and MET cohorts in Lecture 7 on Moodle and results dated 17 March 2025 will be published in Lecture TBD.**
* Analysis of the results of your primary research (survey questionnaire) use the pie charts and graphs generated accordingly and describe each with a corresponding paragraph on what the question was, the results obtained and explain any trends in the results. This section shall contain ‘convincing arguments’ and ‘critical analysis and evaluation techniques.’ **Compare the primary research to the secondary research (literature review) for P4. Questions you can ask yourself in this discussion are for any particular aspect, does the primary agree with the secondary research? If yes, fine, but if no, why? Try to explain the difference.**
* For M3 – show utilization of one of the three methods of evaluation of design alternatives (numerical evaluation matrix, priority checkmark or best of class chart)
* Critically analyse the project outcomes making recommendations for further development, or further studies. For D3, use the deficiencies detected in the morphology chart and even in the evaluation methods to identify and make these recommendations.
* For achievement of D2 criteria: critically evaluate the success of the project plan making recommendations for improvements. Generate a table or answer in paragraph form. Critically evaluate means to make a judgement taking into account different factors and using available knowledge/experience/evidence where the judgement is supported in depth. You would have realized that you project plan did not work out precisely to your actual project progress. There were shifting dates for each activity when comparing planned to actual. Some activities have earlier or later starts and/or earlier or later completions. Discuss any two activities that were ahead/on/behind schedule on two of the three progress report dates (16, 30 Sep and 07 Oct 2024).
* Comment on the reasons why you were ahead/on/behind schedule.
* Comment on the repercussions of being ahead/on/behind schedule.
* Comment on ways to mitigate this occurring in future projects.
* ALSO, for D2, use exclusively the Reflective Log (see template below) to critically evaluate your own behaviours while working on the project in terms of ethics, health and safety and professional standards of behaviour, see attached template in Moodle.
* Summary and Conclusion.
* References.
* Appendices.

Fill out this **Reflective Log** Template for achievement of D2 criteria. Generate a table or answer in paragraph form. This Reflective Log should include a comment about your work (on this project) experience overall. However, you should not simply describe what you did at work (on this project) you should reflect. This means that you should think about and comment on what you did. Examples of thinking about and commenting are below. Whatever you write about, it must be related to your Project.

1. Consider what you have done and whether you enjoyed it, found it easy, interesting (or not), and why.
2. Consider what skills you have learned or improved.
3. Comment on your rate of progress and why you are progressing at this rate (i.e. are you picking skills and understanding up quickly, or not?).
4. Are you happy with your performance? Why/why not?
5. Comment on your confidence levels; are they changing? Why/why not?
6. Comment on your strengths and weaknesses; how can you improve?
7. Comment on what you find difficult and how you will try to overcome your difficulties.

D2 Critically evaluate the success of the project plan making recommendations for improvements using

M2 Explore alternative methods to monitor and meet project milestones, justify selection of chosen method(s)

P3 Conduct project activities, recording progress against original project plan

D3 Critically analyse the project outcomes making recommendations for further development

M3 Use appropriate critical analysis and evaluation techniques to analyse project findings

P4 Produce a project report covering each stage of the project and analysing project outcomes

Objective Tree outline for CNG at liquid fuel station:

* CNG
* leak detection
* fillable
* measurable
* affordable
* consistent available supply
* maintainable
* quiet
* satisfy design codes and standards
* satisfy statutory and regulatory agencies
* safety mechanisms to prevent accidents - break away hoses and pressure relief shut off valves

Some aspects to consider are also:

* Understand the physical properties of natural gas.
* Become familiar with the national codes and regulations for CNG fueling stations.
* Understand the basic components of CNG fueling stations and their functions.
* Understand the types of CNG fueling stations and their applicability.
* Understand the factors affecting capital costs of CNG fueling stations.
* Understand the basic processes for sizing a CNG fueling station.
* Understand the basic parameters of budgeting for a CNG fueling station.
* Become familiar with the data required to develop a CNG fueling station specification.
* Understand the components of and processes required to permit a CNG fueling station.
* Understand the CNG fueling station construction bid package and what is included.
* Become familiar with the basic safety systems and procedures for CNG fueling stations.

Objective tree for solar powered EV charging station in liquid fuel station:

The following criteria/parameters can serve to guide the student on developing a Objective tree.

* accessible
* chargeable in $$$
* measurable for $$$ by time or unit rate (kW)
* affordable
* consistent available supply (reliability)
* maintainable
* quiet
* satisfy design codes and standards
* satisfy statutory and regulatory agencies
* generative capacity of PV panels and surface area of quantity of panels required and offsite PV panel location
* storage capacity of batteries and volume space required for batteries, battery technologies.
* safety mechanisms to prevent accidents - break away cables, short circuit detection and prevention
* Load detail/power analysis
* Charging time per car