

ENGINEERING TECHNOLOGY

FACULTY OF MECHANICAL

MMJ10403 – Thermodynamics 1 Sem 2 2022/2023 Assignment 2

Due : 11 Jun 2023 (Sunday) by 11.59 pm

Marks : 10 points

Submission method:

- File upload to GOOGLE CLASSROOM (class code : 5ias2y5)
- Report must be prepared in pdf
- Filename must be in the following format: ID NAME.
- ID is student matric number
- NAME is student's full name

Note

This assignment has the following mapping:

- **PO 1** : Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to the solution of complex engineering problems.
- **CO 2** : Ability to formulate energy balance accordingly to the first law of thermodynamics for a system.

Instructions / to do list

- 1. Show all works/procedural analysis. You will lose marks for incomplete submission.
- 2. Read and signed the **student statement**, acknowledging that you have read understand the repercussion of plagiarism during early of the semester.
- 3. Any work that is caught under plagiarism will be awarded with 0 mark.
- 3. Your works must be map to the above PO and CO.
- 4. This assignment needs to be submitted in a single pdf file via the Google Classroom.
- 5. You also can prepare your work using any suitable software.
- 6. The due date for this assignment is on 11 Jun 2023 (Sunday) by 11.59 pm. For each working day late submission, 10 %/day will be deducted from the obtained marks. Please take note that, it takes time especially to upload large size document. So, don't wait until very last moment.

IMPORTANT NOTE

- Marks will be given based on the **novelty (originality)** of your answer.
- If you choose an example that most students did not select for their work, you **will most likely** get higher marks due to your effort and complexity of the example.
- Please put your best effort to prepare this assignment.

Please find a suitable research article that utilizes the first law of thermodynamics by accessing the following webpages:

- <u>https://www.sciencedirect.com/</u>
- <u>https://mjl.clarivate.com/home</u>
- <u>https://link.springer.com/</u>
- <u>https://iopscience.iop.org/</u>
- <u>https://ieeexplore.ieee.org/Xplore/home.jsp</u>

To access the websites, please use UniMAP's student account. If you encounter any technical difficulties, kindly seek assistance from the library staff. Please note that not all articles may be accessible as UniMAP may not subscribe to certain journals.

Once you have selected an article, please include it in your assignment and identify the related equation or formula that mentions the first law of thermodynamics. Use your own words to explain how the equation or formula is related to the first law of thermodynamics in the article. You may use diagrams or figures to supplement your explanation.

Finally, please ensure that your work (excluding the selected article) is within two pages of A4-sized paper with a minimum font size of 12 pt and single line spacing format. The citation format used should match that of the reference section in the selected article. It is essential to understand the citation system as it will benefit you in your academic studies.

Best of luck with your assignment 2!

Answer scheme:

- Successfully identify and clearly state the equation or formula related to the first law of thermodynamics in the selected article. [1 Mark]
- Properly write the related equation in Assignment 2 with all symbols in italics, all nomenclatures and words without italics, and all chemical species without italics. [1 Mark]
- Show/display proper citation of the selected article within Assignment 2. [0.5 Mark]
- Properly format the reference list according to the citation style used in the selected article. [0.5 Mark]
- Provide a suitable explanation of the difference between energy in and energy out in terms of internal energy based on the identified equation or formula. **[1 Mark]**
- Provide a suitable explanation of the net energy transfer by heat based on the identified equation or formula. [1 Mark]
- Provide a suitable explanation of the net energy transfer by work based on the identified equation or formula. [1 Mark]
- Provide a suitable explanation of the net energy transfer by mass based on the identified equation or formula. [1 Mark]
- Provide a suitable explanation of the changes in internal energy based on the identified equation or formula. [1 Mark]
- Provide a suitable explanation of the changes in kinetic energy based on the identified equation or formula. [1 Mark]
- Provide a suitable explanation of the changes in potential energy based on the identified equation or formula. [1 Mark]