

ME568 – Exergy Analysis and Thermoconomics

Assignment Topic: The research homework will focus on examining a specific case study or scenario that highlights the interaction between an energy system, its exergy (quality of energy) use, and the associated economic and environmental considerations, with an emphasis on sustainability.

Guidelines for Preparation:

Topic Selection: Choose a case study or scenario that interests you and aligns with the themes of exergy, thermoconomics, and sustainability. It could be a local, national, or global example (e.g., a power plant, a cogeneration/CHP system, a heating or cooling system, a refrigeration cycle, an industrial process, or a renewable energy application).

Research: Conduct comprehensive research using a variety of reputable sources such as academic journals, government reports, industry publications, and credible websites. Ensure that you gather information from multiple perspectives to develop a well-rounded, qualitative understanding of the topic. (No numerical calculations are required.)

Analysis: Discuss, in a conceptual manner, where and why exergy is destroyed (irreversibilities) within the chosen system, how this relates to the cost of producing useful outputs (the thermo-economic perspective), and what it means for resource use and the environment. Identify the main sources of inefficiency, evaluate the sustainability implications, and explore potential improvement or mitigation strategies.

Presentation: Prepare a well-organized report summarizing your findings. Your report should include an introduction to the case study, a discussion of the energy/exergy–economy–environment interactions, the sustainability challenges involved, and recommendations for more sustainable practices or policies.

Submission Details:

Format: Submit your research report electronically in PDF format via the designated course platform or email to ekocaman@gantep.edu.tr

Please ensure that your document is clearly labeled with your name, student ID, course name and the assignment title.

Evaluation Criteria:

- Depth of research and discussion
- Clarity and coherence of presentation
- Insightfulness of findings and recommendations
- Adherence to academic integrity and citation guidelines

I encourage you to approach this assignment with curiosity, creativity, and a commitment to scholarly inquiry. Should you have any questions or need clarification, please don't hesitate to reach out to me.

Deadline: Friday, 12.06.2026, 17:00. Late submissions will be subject to a penalty unless prior arrangements have been made.

Assoc. Prof. Dr. Hüseyin YAĞLI