

ME509 – Thermal Regenerators

Assignment Topic: The research homework will focus on examining a specific case study or scenario that highlights the role of a thermal regenerator (heat recovery device) in an energy system, its energy consumption and savings, and the associated environmental impacts, 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 thermal regenerators, energy recovery, environment, and sustainability. It could be a local, national, or global example (e.g., regenerators in glass or steel furnaces, rotary/fixed-bed air preheaters, regenerative heat exchangers in HVAC systems, gas turbine regenerators, or Stirling engine regenerators).

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, how the thermal regenerator recovers waste heat in the chosen application, how this affects overall energy consumption, and what it means for the environment (e.g., reduced fuel use and emissions). Identify the main operational considerations or limitations, 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–environment interactions enabled by the regenerator, 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 mail to ekocaman@gantep.edu.tr

Please ensure that your document is clearly labeled with your name, student ID, 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