Thesis Title	**Numerical simulation of the temperature distribution in ground, for the purpose of the implementation of geothermal installations**
Programme of Studies	MSc in Sustainable Energy Systems
Course	MES 580 MSc Thesis
Area of Study	Sustainable Energy Technologies – Geothermal Energy
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Semester	Fall Semester 2022
Short Description	This master thesis focuses on exploring and demonstrating the functionality of geothermal systems and geothermal heat pumps in Cyprus. The research involved conducting Computational Fluid Dynamics (CFD) simulations on three different soil types to assess temperature and thermal distribution up to 100 meters below ground level. Key parameters such as density, thermal conductivity, and specific heat capacity for each soil type were carefully evaluated and incorporated into the CFD simulations, considering an initial outdoor temperature as boundary conditions. The results of the CFD simulations revealed promising prospects for installing new geothermal systems in specific areas of the island. However, the market for ground source heat pumps remained limited due to the prevalent market share of air-to-water heat pumps in Cyprus during the study period. Furthermore, the validity of the CFD simulations was confirmed, compared, and discussed in relation to similar research conducted by other scholars. This study contributes valuable insights into the potential and challenges of geothermal energy applications in Cyprus, shedding light on the need for further exploration and promotion of geothermal heat pump technology in the region.