

Oak Ridge National Laboratory
Engineering Science and Technology Division

Project Number: *Coop012008*

Project Title: Heat Pump Modeling and Energy Use Analysis

Requesting applications from science or engineering undergraduate students to participate in the ORNL Undergraduate Student Cooperative Education Program at Oak Ridge National Laboratory (ORNL) on the following project.

Project Description

This effort is part of DOE-sponsored research and development to promote energy efficiency in building equipment (i.e., equipment that provides heating and cooling, water heating, etc.).

The specific areas of effort are:

- Assistance in modeling and validating new heat exchanger configurations and types for the ORNL Heat Pump Design Model (HPDM) (<http://www.ornl.gov/~wlj/hpdm/MarkVI.shtml>);
- Support in developing and testing modules based on the HPDM for the performance analysis of air-, water-, and ground-source heat pump equipment within building energy use analysis tools such as Energy Plus (<http://www.eere.energy.gov/buildings/energyplus/>) and TRNSYS (<http://sel.me.wisc.edu/tmsys/>); and
- Integration and use of related modules for the analysis of advanced multifunction (cooling, heating, water heating, dehumidification, ventilation) heat pump operation and control in the above annual performance analysis tools.

Qualifications of Ideal Candidate

Junior in Mechanical, Chemical or Electrical Engineering with interest in thermal systems design and control.

Familiarity with engineering programming tools such as Engineering Equation Solver (EES), Matlab, and/or FORTRAN and data analysis and 2- and 3- D plotting tools such as Excel, Sigma-Plot, or Surfer.

Courses in thermodynamics, heat transfer, and programming

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