Course Description

ELMS Site: TBA

- **Prerequisites by Topic:** Undergraduate Thermodynamics and Heat Transfer (preferred)

- **Communication Outside the Classroom:** Emails and ELMS site will be used for communication.

- **Statement of Course Goals:** The goal of the course is to drive energy efficiency innovation in thermal systems used in and around U.S. buildings. To achieve this goal, the course will address and discuss in detail on the psychrometric processes and vapor compression cycle designs. Students will gain a thorough understanding of the potentials of these emerging technologies and experience various aspects of research and development in engineering: designing of psychrometric processes, various cycles and controls, fabricating components, installing thermal systems and conducting testing. This course is the second part of two-semester long effort, the installation and testing of component and systems will be focused on. Outcome of this course will be applied to UMD’s 2017 Solar Decathlon project house.

- **Student Learning Outcomes:** Students are expected to learn in depth the application of heat transfer processes and thermodynamic cycles to building thermal systems. This course is a technical design elective and pulls together the background knowledge in real life examples of design and evaluation.

- **Course Schedule:** Class at 3:30-6:10 pm on Monday, First day of class on Aug. 28 and last day of class on Dec 11.

- **Due Dates:** Project report should be returned in one week after assignment.

- **Expectations for Students:** Students are expected to become familiar with general engineering software (Engineering Equation Solver) and a heat exchanger design software (CoilDesigner) to deepen their applicability of heat
transfer and thermodynamic cycle concepts to real applications.

- **Grading Procedures:** This course is based on design, hand-on work and experimental projects. There will be five projects and a final design project replacing the final exam. Final grade will be determined by 50% from projects, 30% from final design project and 20% from attendance and peer evaluation.

**Textbook(s)**

- Lecture notes will be available to students through ELMS.
- Text book is not required.

**Course Outline**

- Introduction of Solar Decathlon Project
- Moist Air Properties and Conditioning Processes
- Refrigeration Cycle Design
- Instrumentation/Measurement
- Laboratory Safety
- Installation of Thermal Systems in 2017 Solar Decathlon Demo House at UMD
- Testing of Thermal Systems at UMD
- Uninstallation, Packing and Shipping of Thermal Systems to 2017 SD Site
- Installation of Thermal Systems in 2017 Solar Decathlon Site
- Testing of Thermal Systems

**Code of Academic Integrity**

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity of the Student Honor Council, please visit http://shc.umd.edu/SHC/HonorPledgeInformation.aspx.