



Florida International University
Student Branch

ASHRAE 2015 Student Design Project Competition
Information Packet

ASHRAE 2015 Student Design Project Competition

Background Information on Competition

ASHRAE sponsors these competitions to encourage students to become involved in a profession that is crucial to insuring a sustainable future for our Earth – the design of energy-efficient HVAC systems. ASHRAE will recognize the outstanding student design projects at the 2016 ASHRAE Winter Meeting to be held in Orlando, FL, January 23-27th, 2016.

The student design competition's guidelines provide enough background information to enable the teams to design or select the HVAC system for the given building, or to design a sustainable building implementing an integrated building design process (the architectural and building design for sustainability, and its supporting mechanical and electrical systems) for the given program.

The **Integrated Sustainable Building Design (ISBD)** competition's aim is to encourage students to extend their knowledge beyond the core mechanical systems. For the ISBD category, the final design level presented may be in a preliminary stage, as the competition's basic intention is to challenge students' imaginative thinking and creative engineering approach to the building and all of its systems.

The Applied Engineer Challenge's aim is to encourage student creativity and innovation on an applied engineering concept. **This hand's on competition is best suited for students that want to invent or optimize equipment technologies in order to solve market or societal problems.** This design competition challenges the participants not only on the technical side, but also on conception and communication of details in order to share this technology with developing economies as well as the non-engineering community.

Competition Categories

1. HVAC Design Calculations
2. HVAC System Selection
3. Integrated Sustainable building Design (ISBD)
4. The Applied Engineering Challenge

Suggested Buildup of Team

ASHRAE recommends that the project groups consist of at least two members from an undergraduate engineering or architecture curriculum for the HVAC Design Calculations or HVAC System Selection and at least three members (architecture or construction, mechanical & electrical) for the ISBD competition. **Team members can be from multiple colleges. All team members must be enrolled during the semester/term in which they contribute to the design.** The Applied Engineering Challenge is for a team of 1 to 6 engineering students with a keen interest in sustainable design of equipment.

Instructions on Project Submission

Each team must register using this link: <https://www.ashrae.org/membership--conferences/student-zone/design-competition/register-for-the-2015-student-design-competition> (Teams that are registered for the 2015 Design Competition will receive the FTP upload instructions via email. If your team is not registered, you will NOT receive this information.)

- **The submission for the HVAC Design Calculations competition must be in PDF format only!** No separate visual aids will be accepted (PowerPoint, YouTube, etc). Deliverable presentation should consist of a 35-page maximum technical report in PDF format only. **Font size should be 11 pts, utilizing either Arial or Times New Roman.**
- The submission for HVAC System Selection competition is limited to 15 minutes visual aid (PowerPoint, YouTube, etc.) All PPTs have to be automated and not page by page click ALONG with a 30-page maximum technical report in PDF format. Font size should be 11 pts, utilizing either Arial or Times New Roman.
- The submission for the Integrated Sustainable Building Design competition is limited to 15 minutes (PowerPoint, YouTube, etc.) ALONG with a 35-page maximum technical report in PDF format. Font size should be 11 pts, utilizing either Arial or Times New Roman.
- The submission for the Applied Engineering Challenge is limited to a 10 page maximum technical report along with a 15-page maximum installation manual. Font size should be 11 pts, utilizing either Arial or Times New Roman. The 2 reports should include, at a minimum, the following:
 1. Description of the unit design.
 2. A "do it yourself from scratch" manual with operation and maintenance manual.
 3. All documents must be presented in PDF format, no color and should be clearly readable in black and white print.
 4. A review of all major assumptions.
 5. Supporting calculations

Project Time Line

What is the Evaluation Time Schedule?

There will be three levels of evaluation except for the Applied Engineering Challenge. Evaluators at all levels will judge the design project reports, not only for content, but also for compliance with the contest rules.

***The Applied Engineering Challenge will only be judged at the society level by a special committee and students must adhere to the June 1 final deadline.**

May 4, 2015

Entries must be submitted electronically by this date by uploading the entry to the ASHRAE Society FTP site established for this purpose. Only teams who register will get the FTP site information emailed to them, so please register at least 30 days prior to this date to allow for processing. Only ASHRAE chapters with registered teams will have the FTP site emailed to them as well.

May 18, 2015

Deadline for local ASHRAE Chapters to forward their selection of the best entry in each category to the Student Activities Regional Vice Chair (RVC). Chapters are to download the necessary entries from the ASHRAE FTP site for local judging. FTP site information is only distributed to those chapters that have teams registered to participate in the competition. Once your selection is made simply email the names of the winning entries to your RVC with a copy to jledford@ashrae.org by the deadline above. If applicable, chapters should ALSO nominate a "rising star" as well. The Rising Star must be a school that does not qualify for the regional or national competition, but is a quality entry and the school has not had a winning entry in the previous three years.

June 1, 2015

Deadline for local ASHRAE Student Activities Regional Vice Chairs to forward their selection of the best entry in each category to ASHRAE Headquarters for national judging. Regional Vice Chairs are to download the necessary entries in your region from the ASHRAE FTP site for judging. Once your selection is made simply email the names of the entries to jledford@ashrae.org by the deadline above.

All entries that pass regional judging will be submitted to the national judging committee for final judging.

If applicable, Regional Vice Chairs can nominate a "rising star" as well. The Rising Star must be a school that does not qualify for the national competition, but is a quality entry and the school has not had a winning entry in the previous three years.

The Applied Engineering Challenge will only be judged at the society level by a special committee and students must adhere to this final June 2 deadline.

June 19, 2015

National level competition under the direction of the Student Activities Student Project Competition Subcommittee will complete evaluation of national level entries, and will select 1st, 2nd and 3rd place winners in each category. In order to encourage additional schools to participate in the competition, a "Rising Star" winner will be chosen within each category from among those schools that have not had a winning entry in the previous three years.

Please Note: The Society level of the competition is conducted during a closed subcommittee session and therefore, team members and/or faculty advisors, or other persons outside of the Student Activities Committee, may not attend. Any violation of this notice can result in a team's disqualification from the competition.

Monday August 4, 2015

Winners announced: WHICH WILL BE US OF COURSE.

Competition Breakdown

The 2015 student competition focuses on a 3-story classroom and office building in Doha, Qatar. Unlike past competitions the building must be located in Doha, Qatar, or the entry will be disqualified. The final HVAC System Selection and Design for the proposed building shall address the following major design goals:

- Low Life Cycle Cost
- Low Environmental Impact
- Comfort and Health
- Creative High Performance Green Design
- Synergy with architecture

Project Requirements

1. HVAC Design Calculations

For students who have attended 1-2 HVAC courses. Focuses on the design calculations required to provide an energy-efficient design for the facility. Students are required to determine heating and cooling loads, and design the selected HVAC systems for the building, while demonstrating compliance with ASHRAE Standards 55, 62.1, and 90.1.

2. HVAC Systems Selection

For students at schools completing a dedicated HVAC or building environmental systems curriculum. The project encourages students with a solid HVAC base to use life-cycle cost process to select the building HVAC system(s) as well as incorporate the sustainability process promoted by ASHRAE by integrating ASHRAE Standard 189.1-2011 - Standard for the Design of High-Performance Green Buildings, and the US Green Building Council's LEED™ Rating System (or equivalent in the home country of international students.)

3. Integrated Sustainable Building Design (ISBD)

This 2014-2015 student competition requires multidisciplinary teams to design an energy efficient sustainable project approaching a "Zero Energy" building with minimized energy demands for HVAC and all other technical systems that could be satisfied with locally available or building-installed renewable energy sources (RES). Students will be asked to satisfy a national or local sustainability standard (LEED or the equivalent in their country), and then implement RES to approach "Zero Energy" limit.

The fundamental goal of this design competition category is to encourage students to obtain experience in the ISBD process. Architects and engineers should work together from the very beginning to determine building orientation, layout, materials, mechanical systems, and electrical systems that meet the client's needs and work with the surrounding environment to minimize energy consumption.

4. Applied Engineering Challenge

The Applied Engineering Challenge for 2014-2015 will focus on an outdoor environmental condition that impacts many people. Heat illness, including heat exhaustion and heat stroke, may affect anyone that performs physical exertion even in mild outdoor conditions. Common victims of heat illness include construction workers working outdoors and this year's challenge will focus on this group.