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Innovations beyond the classroom
Ferris State University's Heating, Ventilation, Air Conditioning and Refrigeration Program Course - HVAC 451 - completes an Energy Audit on the Van Andel Museum

Ferris State University's Heating, Ventilation, Air Conditioning & Refrigeration Program (HVACR) has a long history of providing innovative service project such as "HEAT'S ON," featured recently in The Big Rapids Pioneer. Now, as it does every year, an Energy Analysis and Audit class – HVAC 451 – where by students under the direction of Mike Korcal, Assistant Professor, John (Eric) Quilitzsch, Assistant Professor, and Douglas Ford Zentz, Assistant Professor, learn how to implement an Energy Audit. An Energy Audit is a very creative and yet practical approach for energy conservation that could potentially save an organization thousands of dollars if implemented. Last year the Energy Audit was performed on The Big Rapids Charter Academy located in Big Rapids under the direction of Assistant Professor, Joseph Pacella. This year collective efforts began on October 11, 2006, at the Grand Rapids Public Museum.

Mike Feutz, Department Chair of HVACR, notes, "The Bachelor of Science degree in HVACR Engineering Technology is recognized across the country and around the world for producing the highest quality students that are placed on the job at ninety-nine percent upon or before graduation. Forward–thinking, innovative strategies at Ferris State University have allowed our college to fill a niche of technical, service-oriented, and community-driven workers. Our educational partners, consisting of industry and education, are continually looking for meaningful ways to extend the HVACR learning experience to a level beyond the walls of Ferris State University. A part of the HVACR

learning experience is a student's ability to perform an Energy Audit that takes them to that next level."

As a part of the curriculum for HVAC 451, students were required to investigate the building by conducting research that allows them to analyze the design, operation, and performance of the building's HVACR components and systems. Next, students confer with the building's personnel to discuss current operating and maintenance procedures, known system malfunctions, or obtain any other pertinent technical information that may be useful. From the information provided, student teams return to Ferris State University to analyze the findings and apply knowledge of engineering principles by:

- Investigating equipment issues, faulty operations, and making recommendations for repair,
- Researching utility data to ensure costs are accurate, proper application of rates and exemptions.
- Researching and analyzing customer design proposals, specifications, manuals, and other data to evaluate the feasibility, cost, and maintenance requirements of designs or applications.
- Reading and interpreting blueprints, technical drawings, schematics, and computer-generated reports,
- Specifing system components or direct modification of products to ensure conformance with engineering design and performance specifications,
- Researching and evaluating the design, installation, operation, and maintenance of the mechanical plants, equipment, systems, and processes to meet modern code and standard requirements,
- Conferring with HVAC team members and other personnel to implement operating procedures, resolve system malfunctions, and provide technical information,
- Conducting research that tests and analyzes the feasibility, design, operation and performance of propsed equipment, component and system modifications,
- Providing feedback – verbally and in writing – as a sales proposal that is presented to the client by the class.

Lucky Chandana, Heating, Ventilation, Air Conditioning Refrigeration Bachelor's degree candidate for Spring of 2006 comments, "The opportunity to work outside the boundaries of conventional educational structures has allowed me to transfer lecture

material from the required text of the class to real life application using a hands-on approach. A combination of technical knowledge and interviewing techniques were used when our team visited the Museum."

Professor Mike Korcal, instructor of the HVAC 451 Class, commented, "This class serves three very important functions. First, students are provided the opportunity to utilize everything they have learned in technical and non technical areas such as Math, Science, Physics, and Technical Writing. Second, this class requires the student to learn how to work as a team performing an energy audit. Students work as a team with common goals such as understanding and meeting timelines and production schedules where priorities and delegations are established. In addition, students must provide information by effectively communicating with clients, teachers and peers by using verbal or advanced technical writing abilities. Last but not least, this class affords the student the right to gain work experience they can capitalize on and add to their resume."

Adds Mike Feutz, Department Chair of the HVACR program at Ferris State University, "Capitalizing on this experience is what students do. When students finish HVAC 451, not only can they do the job, they can complete an Energy Analysis and Audit successfully, making them a highly sought after commodity within the manufacturing sector. In addition, it is this type of training that the HVACR program offers that will take the student to that next level; adding to the student's skill-set and, more importantly, allowing the HVACR Bachelor's degree graduate to be placed before graduation and negotiate an above-average starting salary."