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Dear STARS evaluator,

I am writing to enthusiastically recommend IPRO 336: Implementing the Plant Chicago, as an example of innovation at Illinois Institute of Technology. This project is part of IIT's signature undergraduate research program, the Interprofessional Research Opportunity (IPRO) Program. This IPRO is one of about 35-40 undergraduate research projects conducted each semester at IIT They are "real-world" projects that prepare the students to enter their professions, and are often sponsored by companies or not-for-profit organizations.

Each undergraduate student at the university is required to take at least two of these IPROs to graduate. They usually take them in their junior or senior years after they have completed most of the coursework in their field of study. The IPRO teams are composed of students from at least three disciplines at the university and usually include representatives from engineering, architecture and at least one of the social sciences.

IPRO 336 has been offered every other semester for over two years. This IPRO has been looking at developing the technology and business systems necessary to create a vertical farm in Chicago. A vertical farm is a controlled environment agricultural system which usually grows food in an existing, multi-story building in the heart of the city. The food is grown under artificial light, and the environmental conditions are optimized for year-round production of food. The food raising systems often utilize fish or livestock to create simple ecological systems.

The original IPRO laid out the technical issues required to create a vertical farm in Chicago and identified an entrepreneur who was pursuing the same goal. The entrepreneur, John Edel, is a business incubator developer who had previously created the Chicago Sustainable Manufacturing Center. He was interested in developing a vertical farm, but did not have the expertise to do so. The IPRO worked with him to prototype possible food raising systems for a vertical farm. This was done in first in a 500 sq. ft. system which tested hydroponic, drip irrigation, aeroponic and aquaponic strategies. A subsequent IPRO narrowed down the most successful system to an aquaponics (fish + hydroponics) system, and designed a 1000 sq. ft. prototype.

As a result of success with these small scale prototypes, the entrepreneur purchased a 93,000 sq. ft. former meat packing plant to develop into a commercial scale vertical farm. This facility, now known as Plant-Chicago, is the nation's first operational vertical farm. In the past year that the facility has been in operation, students from the IPRO has set up three, 3,000 sq. ft. aquaponics systems, and have developed both a hydroponic plant raising operations and a fish breeding system. They have also created an environmental management system based on open-source software (which they have written) and an Arduino-based sensor and control system. Everyone working at the plant, with the exception of the farm

manager, has been a former IPRO student. All the design, engineering and construction has been done by these same current and former students. To continue to be able to work with the project, students have volunteered at the plant, done summer internships, been work-study students, developed independent study classes and taken more than the required number of IPROs so that they could remain involved. One student has entered the PhD Program in Computer Science at IIT to continue work on the environmental management system.

The project has been recognized as being a leader in sustainable business development and has been featured in numerous articles including in Discover Magazine and in a cover story in the Sunday Business Section of the Chicago Tribune. A story on WGN television referred to the students as “insanely creative”. The Plant is becoming a model for other similar projects being planned around the country. It epitomizes the innovative programs at the university, and the creative work being done by students within these program.

Best wishes,

Blake Davis