

2nd ANNUAL ELIZABETHTOWN COLLEGE SYMPOSIUM ON SUSTAINABILITY

Tuesday, April 23, 2013 Gibble Auditorium 9:30am to 12:30pm (Posters at 1:15pm in Lobby)

-----Session 1-----



#1 9:30 AM “High-end Phoenix Contact Technologies for International Green Initiatives” by James Kelly



#2 9:40 AM “Reflections from 16 Months of Interdisciplinary/Multicultural Collaboration on a West African Social Business Start-Up”

by Jillian Casey, Jennifer Hughes, Eleanor McCarthy, Joshua Rowlands, Emily Vogel, Julia Ward, and Nicholas Young

#3 10:00 AM “Next Steps in Continuing Work Toward West African Social Business Start-Ups – New Product Development”

by Anthony Fraccica, Joshua Frey, and Courtney Warlick



#4 10:15 AM “Family EcoRise”

by Vaclav Hasik



#5 10:30 AM “Proposed Design to Replace a New Jersey Vacation Home Destroyed by Hurricane Sandy”

by Emily Vogel

-----Session 2-----



#6 11:00 AM “SWOT Analysis of a Sustainable Entrepreneurial Ecosystem in Costa Rica”

by Kyle McNulty and Derek Zmrcic



#7 11:15 AM “Computer Controlled Hydroponic Gardens”

by Sean Flannigan and Andrew Khela



#8 11:30 AM “Analyzing the Hydrological Impacts of a Proposed Sports/Recreation/Fitness Center at Elizabethtown College”

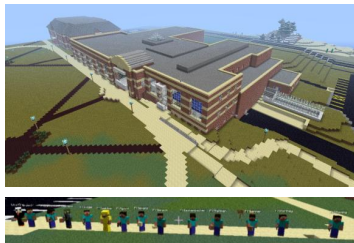
by Deborah Bartyczak, Josh Rowlands, Emily Vogel, and Nick Young

#9 11:45 AM “FEAST(Future Energies and Sustainable Technologies) Club Activities”

by James Annab, Jack Hess, Matt Klempa, and Anthony Fraccica

#10 12:00 PM “Social-networking, Crowd-sourcing Teamwork to Rapidly-Prototype Green Architecture and Communities”

by Ricky Sturz



#11 12:15PM “Solar Decathlon Charette” by Vaclav Hasik

-----Posters-----

(1:15PM in Lobby): **“LEED (Leadership in Energy and Environmental Design) Architectural Design”**

by Shane Weller, Kyle Wilt, Meghan Donahue, Emily Vogel, and Vaclav Hasik

Details



“High-end Phoenix Contact Technologies for International Green Initiatives”

by **James Kelly, Computer Engineering Senior**

Mentors: Dr. Estrada, Dr. Wunderlich, Jack Nehlig, President of Phoenix Contact USA

Phoenix Contact is a Multibillion Dollar, 12,000-employee electronics company with US headquarters 15 minutes from Elizabethtown College. A very close relationship between this company and Elizabethtown College has existed for ten years. This talk will discuss the use of Phoenix Contact high-end technologies, including a summer externship by the speaker, for use in sustainability applications throughout the world.



“Reflections from 16 Months of Interdisciplinary/Multicultural Collaboration on a West African Social Business Start-Up” by **Jillian Casey, Jennifer Hughes, Eleanor McCarthy, Joshua Rowlands, Emily Vogel, Julia Ward, and Nicholas Young**, Mentor: Dr. DeGoede

We are a multidisciplinary team (engineering, international business, and political science) collaborating to develop an affordable (<\$10) solar mobile phone charger for the West African country The Gambia. In this session we will offer reflections on more than 1 year working on this project including the challenges of (1) multicultural and multidisciplinary collaboration, (2) designing for extreme affordability, (3) structuring a not-for-profit social business in a culture and legal environment unfamiliar with the concept, and (4) how work on this project and time spent in West Africa has changed our perspective professionally and personally.

“Next Steps in Continuing Work Toward West African Social Business Start-Ups – New Product Development”

by **Anthony Fraccica, Joshua Frey, Courtney Warlick**, Mentor: Dr. DeGoede

We are building on the work of the 2012-2013 interdisciplinary team developing appropriate technologies for developing countries. In particular we are developing affordable solutions to the problem of access to electrical power. The 2012-13 team is completing technical design and the development of a business plan for a social business to assemble, distribute and sell low cost (<\$10) solar mobile phone chargers. In particular this product is being designed for the West African country The Gambia, where typical individuals in rural villages live on less than \$1.25/day. This semester we are developing specifications to extend the product-line of the social business, continuing the model of economic and environmental sustainability.



“Family EcoRise” by **Vaclav Hasik**,

Engineering Junior (Sustainable Design, and Mechanical Engineering Concentrations) Mentor: Dr. Wunderlich

“Family EcoRise” is a sustainable urban housing concept. This project was part of our Green Architectural Engineering course (EGR343), which teaches traditional green engineering methods for buildings and construction. The goal of this project was to use these methods for the design of our own residential building. This particular concept is trying to use the traditional U.S. row-home features while creating more sustainable way of living through smart community integration, creation of natural habitats, use of local and renewable resources, and use of efficient materials and utilities. The design process included initial brainstorming and sketches, followed by the use of a computer modeling system (Revit) that allowed for 3D perspectives, floor plans, elevations, and section views.

Important part of the project was attention to local building codes, zoning ordinances, and implementation of LEED (Leadership in Energy and Environmental Design) green building guidelines. Being environmentally conscious is important for the future of our planet. The human population is rising and so is the demand for resources. In the U.S., 40% of these resources go into our buildings, and that is why we need to rethink the way we build and develop our infrastructure.

“Proposed Design to Replace a New Jersey Vacation Home Destroyed by Hurricane Sandy” by **Emily Vogel**, **Engineering Senior (Sustainable Design, and Mechanical Engineering Concentrations)** Mentor: Dr. Wunderlich



Hurricane Sandy seriously devastated the East Coast and left many homes completely destroyed. To replace these homes, a tragedy can be turned into a great opportunity to introduce LEED and sustainable design. This particular project focuses on a home in the middle of Long Beach Island, NJ. This project was part of the Green Architectural Engineering course (EGR343), which teaches traditional green engineering methods for buildings and construction. The goal of this project was to use these methods for the design of our own residential building. This design focuses on optimizing the positive aspects of the site, while mitigating the less appealing features. The design also features many ways of meeting the LEED (Leadership in Energy and Environmental Design) standards by using energy efficient products, building with local resources, and orienting the building in a way to enhance natural light. The design process included initial brainstorming and sketches, followed by the use of a computer modeling system (Revit) that allowed for 3D perspectives, floor plans, elevations, and section views. Sustainability is crucial to the future of the planet. Buildings are the biggest consumers of energy, both in construction and operation. This makes it important to design buildings to be constructed in not wasteful ways and to operate on minimal energy.

“SWOT Analysis of a Sustainable Entrepreneurial Ecosystem in Costa Rica”

by **Kyle McNulty, Industrial Engineering Senior, Derek Zrnec, International Business Senior** Mentors: Dr. Estrada, Dr. Sandu



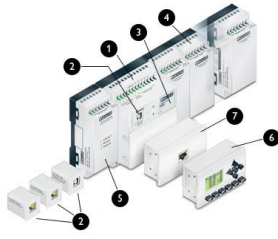
The presentation will showcase our findings thus far and what we plan to accomplish in the upcoming year. During our research we have examined the internal and external environment of Costa Rica in regards to Entrepreneurship. A technique used to aid in interpreting our findings was the use of a SWOT analysis; applying the analysis, we turned our observations into supportive ideas that could later be used to support the concentration of the paper. The key focus of the analysis is to observe the entrepreneurship ecosystem that presently exists in Costa Rica and deciphered the future possibility of sustaining and enhancing the rich entrepreneurial environment. Internally, we examined strengths and weakness and externally we examined opportunities and threats of Costa Rica in relation to the entrepreneurship ecosystem. The presentation will also discuss the scope and limitations of our research while providing information about the culture of Costa Rica

(OVER)

“Computer Controlled Hydroponic Gardens”

by Sean Flannigan, Information Systems Senior, and Andrew Khela, Computer Engineering Sophomore

Mentors: Dr. Wunderlich, Dr. Estrada



This talk will discuss the evolution of hydroponic gardening technologies over two courses, EGR/CS434 Green Robotics, Automation, and Machine Intelligence, and EGR/CS Digital Design & Interfacing, plus an internship with Phoenix Contact, and applications to EGR410 Control Theory. This initiative began with a small tented garden as a course project in EGR./CS434, and has grown into a collection of gardens using a network of Phoenix Contact Programmable Logic Controllers.

“Analyzing the Hydrological Impacts of a Proposed Sports/Recreation/Fitness Center at Elizabethtown College” by EGR 365 representative

Mentor: Dr. Read-Daily

Current efforts are underway to determine the feasibility of adding a Sports/Fitness/Wellness center to Elizabethtown College’s campus. Such a complex would provide updated facilities for the athletic teams as well as give increased access for students seeking improved physical and mental wellness. Aside from the major undertaking of funding such a large facility, the environmental impacts of such a structure need to be considered. In particular, the additional surface water runoff due to the large footprint of the building may compromise the recently renovated dam on Lake Placida. The campus is generally sloped towards Lake Placida, and consequently, a substantial portion of storm water from the immediate area is conveyed to it. Given the size and scope of the proposed building, a significant amount of additional runoff may impact the lake and dam.



As a part of their Engineering 365 Fluid Mechanics and Hydrology Course, students were tasked with determining the hydrological impacts of the proposed Sports/Fitness/Wellness center. Several different scenarios were considered (a) citing the building in a previously undeveloped portion of campus versus citing it in a portion of campus where current buildings are located (b) building a larger facility that would house an NCAA regulation size track vs. a smaller facility with shorter track. Students also determined possible mitigation strategies to prevent negative storm water effects.

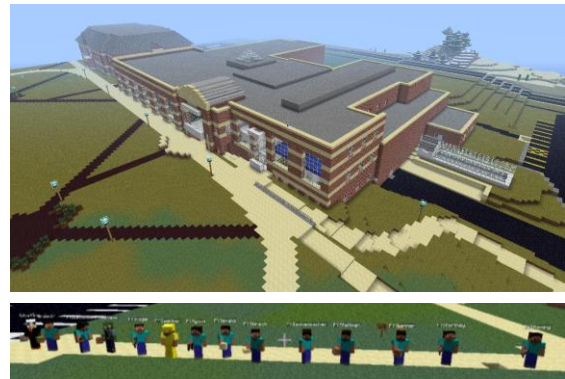
“FEAST (Future Energies and Sustainable Technologies) Club Activities” by James Annab, Jack Hess, Matt Klempa, Anthony Fraccica Mentor: Dr. Estrada
Officers from the student organization FEAST (Future Energies and Sustainable Technologies) will provide a talk describing the club’s efforts. The presentation will include a brief history of FEAST, a summary of recent projects, as well as a description of ideas for future activities.

“Social-networking, Crowd-sourcing Teamwork to Rapidly-Prototype Green Architecture and Communities” by

Ricky Sturz, Minors in Technical Design and Architectural Studies (pending)

Mentor: Dr. Wunderlich

Highlights of an interdisciplinary effort to design green architecture and towns using Minecraft, a sandbox social-networking creative building environment where people from around the world collaborate to build Green buildings and towns in virtual worlds. These virtual environments include computer-generated biomes with varied terrains and weather patterns that designers adapt to. All man-made structures. Landscaping, and gardens are built block by block using a very large inventory of simulation-primitives. Many successful experiments were conducted on two Elizabethtown College sponsored computer servers to allow collaboration between students in several courses: FYS100 Scientific Modeling for Sport, EGR/CS332 Computer Organization & Design, EGR343 Green Architectural Engineering, and CSC462 Cognitive Science Capstone. One experiment included 25 visiting



high-school students. This technology has been adapted by the United Nations for community design of 300 sites around the world, and Elizabethtown college students hope to get involved with similar international efforts.

SEE VIDEOS AT: http://www.youtube.com/channel/UC_kM_k93zreLU40CVvWuHQzq?feature=watch

“Solar Decathlon Charette by Vaclav Hasik,

Engineering Junior (Sustainable Design, and Mechanical Engineering Concentrations)

Mentors: Brian Falcon AIA, LEED AP and Dr. Wunderlich

Other participants: Dr. Read-Daily, Dr. Pat Ricci, Rick Basom, Robert Price, and others

A charette is a conceptual design and planning technique where members of a design team discuss and debate various perspectives. This charette focuses on the design of a sustainably-designed small home that is transportable to the United States solar decathlon competition. This type of interactive design is an integral part of the LEED process (Leadership in Energy and Environmental Design).



AFTER-LUNCH POSTER SESSION: “LEED (Leadership in Energy and Environmental Design) Architectural Designs” by Shane Weller, Kyle Wilt, Meghan Donahue, Emily Vogel, Vaclav Hasik (Sustainable Design Engineering students) Mentor: Dr. Wunderlich http://users.etown.edu/w/wunderli/home_pageARCHITECTURE.html

Symposium Organizers: Dr. Tomas Estrada and Dr. Joseph Wunderlich

Read more: <http://www.etown.edu/depts/physics-engineering/faculty.aspx>