

Proposal to Establish LEED Lab Odyssey Pre-Approved Odyssey Undergraduate Research Credit

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Background: The Hendrix College Campus Sustainability Fund Committee is tasked via its bylaws to increase sustainability education on campus and to fund projects that further sustainability and environmental knowledge. The Hendrix College Environmental Concerns Committee has a similar educational component to its mission. Further, the American College and University President's Climate Commitment requires that the College emphasize sustainability education and climate change awareness. The CSFC operates on a limited budget, but desires to have an impact to all campus buildings and all students, faculty, and staff. For these reasons, we would like to establish a partnership with the United States Green Building Council Center for Green Schools Leadership in Energy and Environmental Design (USGBC LEED) Lab program which will bring students hands-on experiences with LEED and provide the College much needed environmental analysis services for free. Due to the research involved in such an undertaking, we propose that successful participants be awarded Undergraduate Research credit.

What is the USGBC/LEED? The USGBC was founded in 1993 as a non-profit organization that promotes sustainable building practices and operation. USGBC operates the LEED green building rating system. In the case of new construction, a project team will track and monitor construction practices, implement sustainable policies, and design buildings to minimize energy use. In the case of existing construction, a project team will design policies to optimize building efficiency and monitor the maintenance and quality of the building, performing retrofits as necessary. This second type of certification, Existing Buildings Operations and Maintenance (EBOM), is the focus of the LEED Lab program. Typically, LEED EBOM certifications focus more on how the building occupants interact with the building and less on actual construction. For this reason, many and even most of the LEED EBOM credits require lots of time and effort to document, but limited capital to execute.

LEED projects can be certified in four levels: Certified, Silver, Gold, and Platinum. Buildings certified New Construction (NC) are only certified for the structure itself and must apply to be certified LEED EBOM. EBOM certification expires and must be renewed after five years.

Hendrix currently has one building, the SLTC, certified LEED NC, but not LEED EBOM. This means that the building was constructed to LEED standards, but may not be being maintained to them.



What is LEED Lab? LEED Lab was founded in 2013 as a partnership between USGBC and Catholic University of America to certify their architecture building. The program has since expanded to thirteen schools around the world. LEED Lab works by proving students the opportunity to be the ones involved in completing all the paperwork for the LEED certification. This means that students are writing all the applicable policies, measuring buildings, and tracking results. In this way, a college can get their LEED Commissioning completed for free. Commissioning costs for a single LEED project typically run above \$50,000 for an average building. For the thirteen existing partners, LEED Lab is a course offered for course credit. In our case, it makes more sense to offer LEED Lab as an Odyssey Undergraduate Research credit.

Why Undergraduate Research? The LEED process requires that students investigate and learn about sustainability science, primarily by using the LEED Reference Manual. This material is highly technical in nature and is based in conservation science. A benefit from working on a LEED Lab project is the ability to be qualified enough to sit for the LEED GA or LEED AP exams, which are recognized by the industry as the benchmark for sustainability knowledge and science.

Research is the primary component of the LEED Lab program. LEED Lab allows for collaboration between students and energy efficiency professionals. Students learn significant amounts about Sustainable Sites (transportation engineering, site planning and development, storm water management, heat island management, and light pollution management), Water Efficiency (water efficiency management and wastewater management), Energy and Atmosphere (energy management, commissioning, and refrigerant management), Materials and Resources (building reuse management, construction waste management, and resource recovery), Indoor Environmental Quality (air quality management, daylight and views, construction air quality management, and low-emitting materials), and innovation and regional priority credits.

LEED credits also require writing in advanced technical language and presenting this information to the USGBC for approval. All students will be involved in this research and presentation as well as design planning and credit implementation meetings and presentations.

Why Pre-Approved? The LEED Lab program requires that Hendrix offer some sort of credit for successful completion of the program. This has often taken the form of class credit in many instances. However, the problem with offering LEED Lab as an actual class is that there are significant periods of high levels of activity that occur during performance periods and completing LEED paperwork contrasted with periods of inactivity as review periods occur. In a classroom setting, this would require some of the classroom time to be devoted to other activities such as internships in order to fill this downtime. For that reason, since Hendrix has the Odyssey program designed to offer experiential learning opportunities, Odyssey is an ideal fit for the LEED Lab program. The pre-approved part satisfies the USGBC requirement that LEED Lab be offered to students on a regular schedule.



Hours Estimate: The USGBC expects that LEED Lab take at least the time required for a one semester, four credit hour equivalent course. Complete certifications through LEED Lab have historically taken two years to complete. While we will not require a student to be involved for the full time, it will certainly be an option. Students would also have the ability to declare LEED Lab as an internship and receive credit for completing that internship, should they so choose.

Accordingly, the estimated time spent on a LEED Lab project will be 37.5 hours per semester of involvement (equivalent of three 50 minute classes per week). Additionally, we expect that at least one hour of "homework" will be required per class period, adding approximately forty-five hours per semester and bringing the total number of hours to 82.5.

Where Has LEED Lab Worked? The following schools are partners with LEED Lab:

- Ball State University: Muncie, Indiana, Public, 21,053 students During Spring 2015, the Ball State team began certification for the Glick Glass Center. <u>http://www.usgbc.org/articles/leed-lab-action-ball-state-university</u>
- Catholic University of America: Washington, DC, Private, 6,725 students The founder of LEED Lab in 2013. <u>http://www.usgbc.org/articles/leed-lab-action-catholic-universitys-leed-lab-legacy</u> <u>http://www.usgbc.org/articles/leed-lab-sets-course-campus-ebom-certification</u>
- California State University-Fullerton: Fullerton, California, Public, 38,128 students
- California State University-East Bay: Hayward, California, Public, 14,526 students
- Colorado State University-Pueblo: Pueblo, Colorado, Public, 5,000 students *Campus Collaboration for Experiential Learning in Sustainability Education: LEED Lab*, Associated Schools of Construction, 2015: http://ascpro.ascweb.org/chair/paper/CEUE406002015.pdf
- Feng Chia University: Taiwan, Private, 20,000 students
- University of Florida: Gainesville, Florida, Public, 49,042 students Syllabus: http://www.dcp.ufl.edu/files/8fa71614-ccab-4ea8-a.pdf
- Purdue University: West Lafayette, Indiana, Public, 38,770 students
- North Carolina State University: Raleigh, North Carolina, Public, 34,787 students
- University of California-Santa Barbara: Goleta, California, Public, 22,225 students Program began in 2014. <u>http://www.usgbc.org/articles/leed-lab-action-university-</u> <u>california-santa-barbara</u>
- University of California-Merced: Merced, California, Public, 6,268 students
- University of Colorado-Boulder: Boulder, Colorado, Public, 31,702 students
- University of Wisconsin-Milwaukee: Milwaukee, Wisconsin, Public, 28,042 students http://www.usgbc.org/articles/leed-lab-action-university-wisconsin-milwaukee

How Does LEED Lab Help Hendrix?

Several things to note from the above list:

- There are no liberal arts schools listed.
- There are no schools with fewer than 5,000 students.







- There are no schools that do not grant professional degrees.
- There are no schools anywhere near Hendrix.

These factors all distinguish Hendrix from the other schools that have LEED Lab programs and would make Hendrix unique and very progressive in offering this program.

Additionally,

- Students would gain knowledge about the LEED rating system. Generally students gain enough knowledge that they are prepared to sit for one of the two LEED professional exams: LEED Green Associate or LEED Accredited Professional upon completion.
- Students will gain a professional skillset that can be used to further their education.
- Students would feel invested in the sustainability and environmental progress of Hendrix.
- Hendrix would be a nation-wide leader in adopting LEED Lab.
- Hendrix would benefit from lots of labor being put toward LEED projects at minimal cost.
- LEED Lab would focus on policies, procedures, and retrofits, all of which are done at minimal cost.
- LEED Lab will help better integrate departments on campus that typically do not work together as well as bringing in the outside community.
- LEED Lab will result in LEED certifications, which are the industry standard for environmental certification.
- LEED projects dramatically reduce operational costs.
- Reducing energy use helps the environment.

How Will This Program Work? In order to form a partnership with USGBC, Hendrix must commit to the following:

- Offering credit to students who successfully complete the LEED Lab program. This is being fulfilled by the Odyssey UR credit.
- Paying costs associated with submitting certification documents to the USGBC. These costs can be petitioned to be paid by the CSFC.

Requirements for applicants: Applicants must be students at Hendrix in good standing. Applicants must commit to at least one semester of LEED Lab to complete the Odyssey Pre-Approved credit form. Applicants must attend all LEED Lab meetings and successfully complete assigned LEED credit work. Applicants are expected to present their findings during at least one of the design meetings that occur each semester. Additionally, reflection will be part of design meetings and collaboration during the entire LEED Lab process.

The LEED Lab process will work in the following manner:

- 1. Establish a LEED Lab pre-approved Odyssey credit.
- 2. Establish a partnership with a LEED certification organization to provide experience in LEED certifications. This organization will assist students with some of the technical knowledge required to complete the certification standards, provide guidance on LEED write-ups, and serve as the main point-of-contact for students.





- 3. Work to identify a campus-wide LEED certification plan. This plan would include a propose sequence of buildings to be certified and a timeline.
- 4. Solicit applications for a cohort of students to participate in the LEED Lab program.
- 5. Select a cohort of students who must agree to be part of the program for at least one semester. The LEED partner organization, the CSFC, the ECC, and the project advisor will assist in selecting students through an application process.
- 6. During the first semester, determine which credits can be completed for the entire campus and complete policies for these credits. Each student will present at the initial charette. Each credit will be assigned to a student or a group of students. The team assigned to a credit has the responsibility to interface with stakeholders for that credit, discuss with the LEED certification organization how to best complete the credit, work with the organization to document and complete the credit, and present the documentation at status meetings. The LEED certification organization has the responsibility to guide students throughout the process and help track overall performance.
- 7. Identify an initial campus building to begin LEED EBOM certification.
- 8. During the second semester, implement a LEED certification feasibility study that identifies all stakeholders and milestones throughout the entire certification.
- 9. Focus on Performance Period measurement, data, and metrics. Each student will present at the mid-cycle charette.
- 10. During the third semester, collect final data and documentation, complete document reviews, and submit the project for certification. Each student will present at the closing charette.
- 11. The entire team will review the complete LEED certification application.
- 12. The CSFC will assist with finding funding to complete the initial review of the application. This funding may come from the CSFC itself, in-kind donations, or from other outside sources.
- 13. The team submits the initial application.
- 14. The team receives comments from the Green Building Certification, Inc. (GBCI), the independent review body that approves LEED applications.
- 15. During the fourth semester, the team will address any concerns with credit compliance that the GBCI identifies.
- 16. The team submits the final application, if revisions are necessary to certain credits.
- 17. The project receives final certification. The team trains building operators on continuing LEED standards so that recertification will be possible in five years.
- 18. The process continues with additional existing building projects.

Learning Objectives:

- 1. Students will learn about green building and the LEED certification system.
- 2. Students will research and complete sustainability science programs to fulfill LEED requirements.
- 3. Students will learn project management and technical writing skills.
- 4. Students will engage the Hendrix community to discuss campus sustainability.



5. Students will have sufficient experience to prepare them to take the LEED GA and LEED AP exams.

Timeline:

- 1. Fall 2015: Proposal is presented to the Committee on Engaged Learning and approved.
- 2. Spring 2016: Planning to begin LEED Lab program.
- 3. Fall 2016: First cohort of LEED Lab program begins.
- 4. Spring 2017: Second semester of first LEED Lab certification.
- 5. Fall 2017: Final semester of first LEED Lab certification and LEED EBOM submission.
- 6. Winter 2017: First LEED Lab building is certified.