

Ohio Wesleyan University: Environmental Audit Course

Integrating business experience within Environmental Studies

Prepared for

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(an Independent Study)

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Introduction

Environmental Studies at Ohio Wesleyan University is constantly looking for ways to improve the curriculum by integrating courses that teach students concrete skill sets. By incorporating a class based upon environmental consulting/auditing into the environmental studies major, students will develop technical and analytical skills that are desired by many employers. This type of class will give students the competitive edge in landing a job after graduation. My report will review the process that led me to this proposal and recommendations for the implementation of this class.

Purpose and Scope

The purpose of this proposal is to suggest the implementation of an environmental auditing class in the environmental studies curriculum. This class will allow students an opportunity to understand the inner workings of a business/organization, and how to incorporate an environmental agenda within certain business cultures. Student's will benefit immensely from this style of experience-based learning, and acquire skills that are extremely marketable to employers.

Assumptions

One of the main assumptions in this report is that businesses will want to be part of this program or if the University would actually be willing to support this idea. Another assumption is that Sean Kinghorn, who will be teaching the course, is still at Ohio Wesleyan if/when this course becomes official

Methods

The information in this report was compiled from my own personal data collected from conducting the Delaware Green Business Survey, my personal experiences being an Ohio Wesleyan student in the Environmental Studies program, and various other sources. A few other Universities have similar program to the one I am proposing, but this proposal is very personalized and catered to Ohio Wesleyan's environmental studies department

Limitations

One of the main limitations was the survey sample size collected. A total of four businesses in the Delaware area responded to the survey resulting in statistically insignificant conclusions about Delaware businesses' environmental ranking. A broader range of businesses participating in the survey may have helped me make a more decisive conclusion on whether this type of survey is an effective way to change business actions and behaviors regarding environmental issues.

Definitions

Business: This term will be used to describe any type of business or organization. The environmental audit program will include various types of businesses and organizations, but for the sake of the reader when the term business/es is used it refers to all possible businesses and organizations that could be involved.

Background

Before the creation of this proposal I originally administered a green business survey to various businesses in Delaware. My findings from this survey led me to believe the best way to change Delaware businesses 'environmental impact was through an intensive auditing process conducted by Ohio Wesleyan students

Delaware Green Business Survey

The Delaware Green Business Survey was created by one of John Krygier's students for Geog 360, and the purpose of this survey was to collect data about various Delaware businesses and provide them with an environmental rank. This ranking system was meant to be a guide to help these businesses improve their environmental impact. The survey asked technical questions about energy use, water use, waste management and product procurement, but also covered social issues like community engagement and company leadership. It was a fantastic survey, but the questions were oriented more towards large companies and organizations or even government departments or entities. After businesses completed the survey I supplied them with recommendations that would help improve the sustainability of their businesses.

Problems I ran into with the Survey

The main problem was that once this student left Ohio Wesleyan, her Google account expired and the survey, which was formatted in Google docs, was erased. I only had access to a PDF form of the survey, which allowed me to recreate the survey, but I could not view the various scroll down answer options for certain questions. If I was able to have the different answer choices in the original document then the survey may have been easier to fill out.

However, another big issue was that the surveys format was not catered towards small businesses in Delaware. Many of the questions were very technical and could be confusing for people unfamiliar with various environmental oriented terms and policies. Cole Hatcher, Director of OWU Media & Community Relations as well as the secretary of Main Street Delaware, took the survey and provided me with feedback. He explained that the survey was thorough, but would be difficult for smaller businesses in the area to answer many of the questions. He answered the questions as if he was filling it out for Ohio Wesleyan, which worked well, but the other businesses I surveyed seemed to struggle with the questionnaire. Along with some of these difficult questions, the survey was 48 questions long and many business owners simply did not complete the survey due to time constraints. I shortened the survey to 38 questions, but I was still left with only four respondents.

If you would like to view the survey please follow the link: [Delaware Green Business Survey](#)

If you would like to view the survey results and graphs follow the link: [Survey Results](#)

The survey results do not suggest any general trends within the data. Also, only having 4 respondents out of all the businesses in Delaware makes this data statistically insignificant, which there is definitely some blame that can fall on myself for that one. However, when taking a step back and understanding the reasoning for the survey in the first place, which was to help implement sustainable practices into Delaware businesses, this survey does not actively engage the intended audience.

The second part of this survey after collecting the business's data was providing each business with recommendations to improve their environmental impact. These recommendations were very extensive and information based, but did not give these businesses the personalized data that would cause the positive change we want to see. For instance if a business owner said they did not use CFL light bulbs the recommendation for this answer would be a link to the Energy Star website about the impacts of CFL bulbs and how to receive rebates on these bulbs. All of the information in the recommendations was great, but I was doubtful any of these businesses would make any changes based on the recommendations. After coming to this conclusion I thought about ways students could truly change a businesses' operations and policies in order to become more sustainable and environmentally friendly.

Here is a link to the various recommendations for the businesses that participated in the survey: [Recommendations](#)

Environmental Consulting/Audit Class

General Idea of the Class

The main idea behind this class is that business owners in Delaware after receiving the recommendations from the Green Business Survey will most likely shrug their shoulders and do nothing. By allowing students to actively pursue these recommendations within these businesses, students will gain a vast amount of knowledge in the field of sustainability, a stronger connection to the Delaware community and the positive environmental changes that we all want to see. Each student would be paired up with a business in Delaware or a group of students for a larger business, and try to instill sustainable changes based upon the data from their environmental. The student run environmental audits will not be of the same level as a professional audit, but the point is that the majority of small businesses in Delaware still have plenty of low hanging fruit items that students can focus on.

Each student will learn analytical skills, such as how to write a cost benefit analysis for the suggested changes they make, and understand how to effectively communicate in a professional environment. Sean Kinghorn will be able to assist students throughout the auditing process, and teach them how to structure the necessary formal reports. Students may run into some difficulties when trying to make changes in real world situations, but that is more valuable to a student's learning experience than any classroom lecture. This

type of class is desperately needed in the environmental studies program and will significantly benefit students within the major.

What is an environmental audit?

There are various types of environmental consulting and auditing, but for the purpose of this class the main focus will be on businesses' operations, infrastructure, and resource use. However, since environmental audits are so broad students can focus on a range of environmental topics pertaining to their particular businesses.

Shown below is a formal definition of environmental auditing and categories within the field

Environmental auditing is a systematic, documented, periodic and objective process in assessing an organization's activities and services in relation to:

- Assessing compliance with relevant statutory and internal requirements
- Facilitating management control of environmental practices
- Promoting good environmental management
- Maintaining credibility with the public
- Raising staff awareness and enforcing commitment to departmental environmental policy
- Exploring improvement opportunities
- Establishing the performance baseline for developing an Environmental Management System (Environmental Audit 1)

When comparing these categories to the layout of the Delaware Green Business Survey, the similarities are uncanny, but due to the size and complexity of the survey it should not be the first form of contact with these businesses.

Creating a shorter Delaware Green Business Survey

In order for this class to be a success there needs to be a substantial amount of businesses in Delaware that would like to participate in the student run environmental audit program. The first step is to figure out which companies would be interested in this type of program. The creation of a shortened version of the Delaware Green Business Survey can be sent out in a shotgun style approach to all Delaware businesses and will most likely receive a higher percentage of respondents. The data can still be used for mapping the sustainability region ☺ and one of the survey questions will also ask if they would like to be involved in a student led environmental audit.

Here is the link to a sample of the shortened Green Business Survey and of course more revisions will need to be made before sending it out: [Shortened Green Business Survey](#)

I might be a little optimistic to think this survey is going to result in a large number of businesses and organizations lining up to be involved in this program, but it is important to still have this mapable data and a list of companies that may possibly be interested. However, in order to make this official and fully engage these companies the University will

have to personally contact each business. A formal letter must be designed to elaborate exactly what the students will be doing and the purpose of the program. The letter will also entice these companies through the speculated cost savings and marketability these students can bring to their business. It is also free labor, which is another incentive.

Structure of the Class

The structure of the class is completely open to revision, but ideally Sean Kinghorn would teach it. Before Sean came to Ohio Wesleyan he was an environmental consultant in California and did exactly what students would be doing in this type of class. Sean would review students' progress in their consulting process and help them structure cost benefit analysis for certain actions and changes these businesses should make. This would be a great way to integrate economics into the environmental studies curriculum, and give Sean a larger role within the academic aspects of the University. The class would have a normal meeting time where students can review the progress of their projects and ask any questions they may have. Along with that, Sean can give details into proper auditing assessments and provide necessary contacts students may need. At the end of the semester students will compile a report of their various findings, and changes/proposed changes that have been made in their assigned businesses. If a student is able to say they saved a business \$10,000 over a 5-year period due to proposed changes in energy efficiency, then that is a great quantitative achievement. This class will provide environmental studies majors with marketable skill sets and achievements that employers look for in a college graduate.

Conducting an Environmental Audit

Pre-Audit assessment

Before jumping right into the on-site audit one must create an audit plan. The audit plan is an outline that helps an individual understand the entire process of an environmental audit. The general format of this plan should be based around the "5 W's" of an environmental audit.

Figure 1: Environmental Audit Plan Structure

Where: audit site & boundary with overview

What: scope & objectives

How: site personnel interview, site inspection, audit protocols; site logistics and administrative arrangement

Who: audit team and site facilitation arrangement

When: audit schedule and milestones

Source: "Conducting an Environmental Audit", Dec. 10, 2012

http://www.epd.gov.hk/epd/english/how_help/tools_ea/files/part1_5.pdf

Once the students have created their environmental audit plan for their businesses the students must develop a thorough pre-audit questionnaire. The questionnaire should be oriented to their business specifically, but also should ask some of the general questions needed in every audit. These questions would often be more like the one's seen in the original Delaware Green Business Survey. Shown below is an example of some topics that should be brought up in this questionnaire.

- **Overall environmental management:** Understanding how the administrator or manager of the business has implemented certain sustainable initiatives or policies.
- **Procurement policy:** Many of the sustainable initiatives that need to be pursued involve natural resources, and understanding the supply chain of a business is crucial for recommended improvements.
- **Energy management:** The questions for this topic should ask simply how much the owner pays per month for energy, the square footage of the facility and large energy consuming systems/devices in the building.
- **Materials management:** looking into whether the business uses post consumer material, recycled content items, etc.
- **Water and wastewater management:** How much water the business uses monthly and comparing that to the number of water consuming devices
- **Waste management:** Waste diversion tactics
- **Staff awareness and training:** Is sustainability part of company culture and incorporated in the daily operations of employees tasks.

The students can base the questionnaire on their particular interests, such as waste diversion, but it must also be applicable to the industry involved. For instance, a bookstore produces a significant amount of cardboard and packaging material so the student should focus the majority of questions of recycling and product procurement. In regards to the class and providing analytical data it would be preferred for each student to obtain utility data for the businesses in the past 12 months.

Applying pre-audit data to the initial site visit

Before stepping foot into the building the student is auditing he/she should already have an idea of the most pertinent issues to focus on. The student run audit by no means needs to be equivalent to a professionally done audit and due to the lack of equipment simply cannot, but the audit will primarily focus on the basic low hanging fruit that many small businesses do not think about or have time to implement. Some examples of these simple actions can be the use energy efficient light bulbs, light motion sensors, low flow devices on toilets and faucets, and regulating heating and cooling of the building.

On-site audit

The duration of the on-site audit can vary due to each student's interests. If a student only wants to focus on energy efficiency and water management then that may only take a few hours, but if a student is interested in staff awareness and community involvement he/she may spend weeks setting up meetings in order to collect the proper data for adequate recommendations. However, a crucial part of these kinds of audits is photo documentation and every student needs to take pictures. Photo documentation is beneficial when trying to remember the physical layout of businesses and when compiling a formal report.

Every on-site visit for each student will be different and this is one of the most important aspects of the class. There is no silver bullet to implementing sustainable changes in a business even if it makes sense in almost every category. One of the hardest things for people is change, and the students in this class will learn the invaluable skill of persuading others through various tactics. Some individuals are influenced by the economic feasibility of a project, and others care about the social and environmental impacts of a project. The key to sustainability is creating a balance between all three of these categories (economic, social & environmental) to make changes, whether it is appliances, infrastructure or behavior.

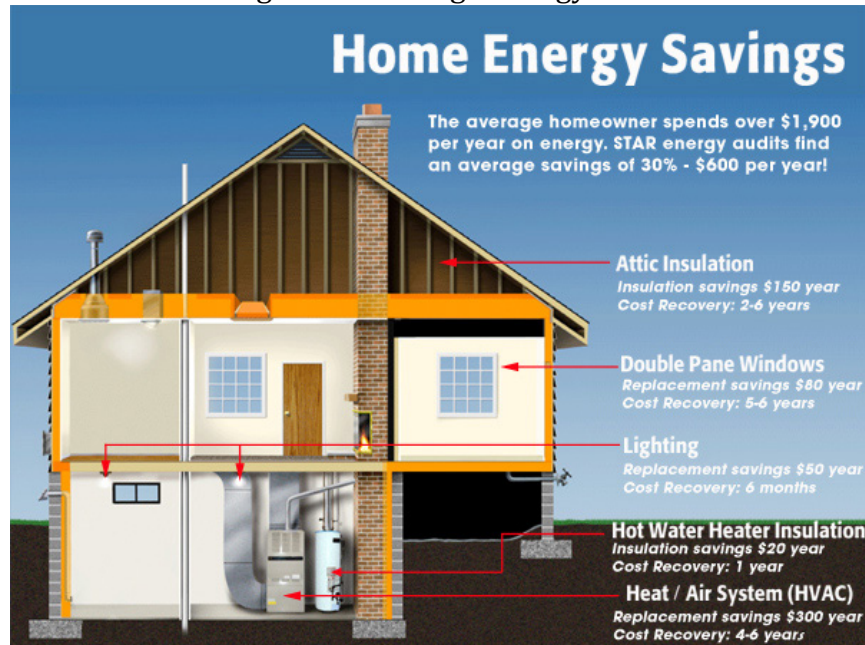
Below I describe some of the different types of audits students can conduct

Energy Audit

A professionally done energy audit uses an array of expensive measuring equipment, but for the purpose of this class it is not necessary. The blower door test and infrared gun help spot the hidden problem areas in a business, but there are numerous other easy steps that businesses can take to save energy.

If a student wants to focus on improving energy efficiency in a facility, then he/she should follow some of the proper procedures in conducting a simple walkthrough energy audit. All of these steps should be taken after the student has collected the pre-audit information; energy bill for past 12 months, price per kWh, number of rooms in the building, and any other information the owner thinks is important regarding energy usage. Another factor students should consider is that not all business owners in Delaware actually own the building. Arrangements will need to be made with the tenant owner, but this should not be a huge issue.

Image: Walkthrough Energy Audit



Source: <http://energyauditinstitute.com/home-energy-audits.html>

1. Examining the buildings light fixtures: Over 10% of business's energy costs comes from lighting

- Count the number of light fixtures in every room and record the type of bulb being used.
- Based on the bulbs wattage, the number of light fixtures and the rooms hours of use, one should be able to calculate the amount of energy used for light in a particular room

2. Record the various electronic devices found in each room (computer, refrigerator, speakers, etc)

- Write down the wattage use of these devices and how long they typically stay on for
- Many of these devices fall into the phantom energy category so consider that in the data

3. Ask to view the HVAC (Heating, Ventilation and Air conditioning) system

- Record the type of system that is being used and the amount of energy it uses.
- Older HVAC systems tend to be extremely inefficient and when heating and cooling equates to about 50% of the average energy bill, this is something that needs to be looked at
- Also, look for mold around the ventilation ducts where the water condenses in the HVAC system. This is a common problem many businesses face and I am sure the owner would be very appreciative for pointing out a possible healthy hazard.

4. Inspect the facility for large air leaks and compromised insulation
 - This may be difficult without conducting the blower door test, but sometimes there are obvious problems in a business's insulation that can be fixed by caulking or cheap insulation.
5. Inspect the building's thermostat
 - Make sure the thermostat can be programmed to use less energy heating and cooling the building while not in use.
 - Ask the owner of he/she would consider slightly altering the room temperature

Once the student has collected this data he/she must compile a report. This report should include their findings, with photo documentation and provide recommendations to save energy costs. The student will design cost benefit analyses on proposed products the business purchases such as CFL light bulbs and will present these findings to the business owner. If the owner wants to make these changes than the student has the opportunity to be actively involved in implementing their proposal. Students may have to browse the web for the best prices on products for these businesses, or even negotiate with vendors about pricing. I believe it is important for students to understand the entire process of completing a project and facing difficulties they never would have initially expected.

Here is a link to some of the guidelines for a walkthrough energy audit:
[Walkthrough Energy Audit](#)

Waste Audit

A waste audit assesses the waste stream of a business. There is no nice way of putting this one, students will need to look in trashcans and figure out the particular types of contents in the waste stream. Waste audits can often be difficult due to the lack of quantitative data provided by the hauling services. Many businesses are charged per pick up and ton, but often smaller businesses share dumpsters with other businesses in the area and this reeks havoc on the data. However, there are a few steps that can be taken.

Image: Waste Audit



Source: http://ontarioecoschools.org/best_practices/waste.html

1. Count the number of trashcans relative to the number of recycling bins or compost bins in the building
 - Examine the layout of trashcans and recycling bins throughout the store and see if the recycling bins are easily accessible for people to use
2. If the business does not recycle at all examine possibilities for a recycling program in the business
 - Truly understand the main reason why this business does not recycle. (Usually for smaller businesses it costs extra to recycle)
 - Work with them and figure out an effective solution to implement a recycling program
3. Dive into multiple trashcans and record the different contents you see.
 - What percentage of the contents are recyclable or compostable
 - Try to understand what is producing which type of waste and how this problem can be solved.
 - Create a pie chart of the different types of contents you find. Visual data like this often shocks people and causes change.

Waste audits can be extremely difficult for smaller businesses and many of the recommendations may not have a numerical value associated with proposed changes. In fact, recycling services sometimes cost more for small businesses that only produce a small amount of recyclables. The student may need to make more personalized recommendations. For example, suggesting the collaboration of multiple small businesses in Delaware collaborating in a recycling program that actually saves them money or the student can just make the case for the environmental and social issues involved in waste diversion.

If you would like to review a few generalized guidelines for conducting a waste audit follow the link: [Waste Audit](#)

Product Procurement Analysis

Another type of audit students can look into is the business's supply chain. The student will need to get the inventory list of the products the business purchases and conduct an analysis on many of these products. Sean would be a great source for the student's to fully understand how to properly audit a business's supply chain, but here are general steps that can be taken.

1. Students receive the inventory list of the products their business purchases
 - Examine which of these items have environmentally preferable alternatives. Ex. If the business purchases cleaning supplies, would they consider a cleaner with a natural cleaning agent

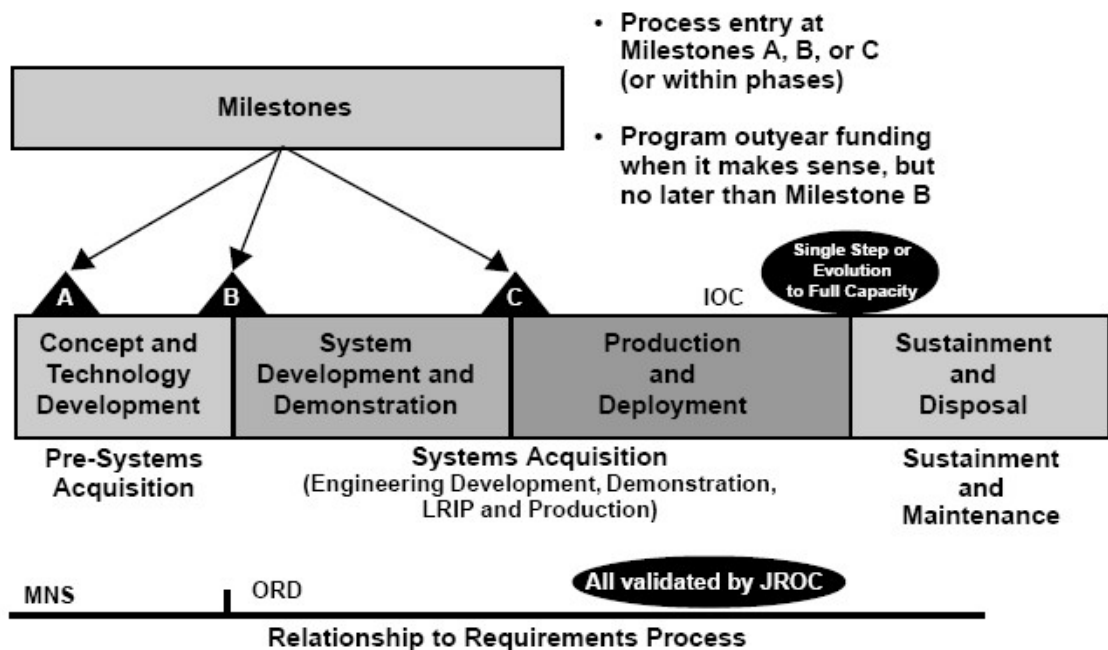
2. After the student has selected a number of products to be reviewed he/she needs to research “green” alternatives.

- This means a lot of internet research and even contacting professionals in the industry
- The student needs to research the environmental impact of a product’s procurement and explain why their alternative product is better.
- For price quoting on the green alternative product the student may need to contact vendors and negotiate a price based upon the quantity of product their business purchases.

3. Once this information has been collected, the student needs to write up a cost benefit analysis on why their business should make the switch to their proposed environmentally preferable product.

- This can definitely be a difficult task beyond price comparisons because assessing the environmental impacts of certain products can be hard information to obtain. The student simply has to try their best to make a case for the proposed product and pitch why it is important for their business to have this product.
- During the process of conducting this research the student should keep a high level of communication with the business owner to understand which type of products could potentially be problematic to the company culture and inhibit certain tasks. The student also needs to address the issue of price increases on these products and whether the business owner would be willing to pay more for a product if it was environmentally friendly.

Image: Procurement Process



Source: http://en.wikipedia.org/wiki/File:Acquisition_Process.jpg

This type of audit may be difficult for some of the businesses students are assigned, but the idea is that these students at least get their feet wet in understanding product procurement and supply chain management. There is no denying the power of purchasing to change behavior and reduce one's environmental impact. If more businesses want environmentally preferable products, but were prevented from making these changes due to time constraints, a contact, or simply being unaware of the options available, then having a student provide these invaluable services can be extremely beneficial. Each business may potentially benefit from these proposed changes, and the students can now show they have experience improving a business's supply chain and understanding product procurement.

There are many other aspects of an environmental audit student's can focus on, but the list of above just provides some examples of simple kinds of audits that can be done without expensive equipment. Before each student conducts a particular kind of audit on the business he/she will want to do more research than simply reviewing this proposal and following the steps provided. The sample audits shown above provide details in to the kinds of work the students will be involved with and the skills they will acquire.

Skills Students Will Walk Away With

There is no denying the abundance of experience and skills students will acquire when taking this course. The experience the students will receive from interacting in a business environment is extremely valuable, and this class would be comparable to many of the skills an individual would learn at an internship in the environmental field. Listed below is the wide range of skill sets students could learn from taking this course and ultimately put on their resume.

List of skills students can put on their resume after taking this class

- Conducting cost benefit analysis
- Supply chain management
- Understanding of environmental policy
- Conducting product procurement analysis
- Energy auditing experience
- Waste auditing experience
- Coordinated a business's environmental community outreach program
- Facilitated staff training on sustainable initiatives
- Resource management
- Effectively communicated in a professional environment
- Saved X amount of dollars for XYZ business
- Changed company policy and improved operation efficiencies

Conclusion

Implementing this type of class into the environmental studies curriculum may be a challenging task, but I believe it is imperative to have this course in the major. The environmental studies department is shifting towards the teaching courses based on sustainability, and having an environmental auditing class is the best way to teach students sustainable practices in a business environment. This type of class can be a huge attraction towards the major, and another steps towards making environmental studies an independent major. Students will be able to walk away with highly desired skill sets, and quantifiable achievements that employers look for. An environmental auditing class would be an extremely positive change for the environmental studies department, and immensely beneficial for students within the major.

Recommendations

1. Speak with any necessary administrators or faculty members that can possibly help implement this type of course into the environmental studies program.
 - These individuals should understand the reasoning for having this type of course, and the various skill sets students will gain.
 - I personally can also help explain the necessity for this type of class within the environmental studies department
2. Make sure Sean Kinghorn is still at Ohio Wesleyan when this course could potentially be offered.
 - Sean Kinghorn (or another professional in the field of sustainability) is crucial for this course and the students understanding of the environmental auditing process.
3. Gauge students' interests in taking this type of class.
 - Would students from various majors want to take this class?
 - Understanding class size: No more than 10?
4. Even if this type of course may not be realistic at Ohio Wesleyan University in the near future continue to push for a curriculum that encompasses many of the traits and skill sets that are at the core of an environmental audit.

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