Innovative and Creative Undergraduate Teaching Proposal

Proposal Title: "Implementing Public Art through Engineering and Technology"
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Rationale:

We are requesting an Innovative and Creative Undergraduate Teaching Award to be put towards developing an interdisciplinary course on Public Art, Engineering and Technology, a collaborative teaching exploration between the areas of Sculpture and Engineering Technology. This award would be used primarily for acquiring new equipment and raw materials necessary to explore innovative methods in Public Art, and to obtain the necessities for creating a rotating public art program on the Weber State University campus. Our goal is that this will be a long-term collaboration between the two areas to combine our expertise and complimentary abilities in exploring innovative technology in a creative context.

Our new courses will be team-taught to explore a range of methods in Public Art, focusing on current fabrication technology, sustainable design, and extended media in three-dimensional artworks. These experimental courses, titled "Public Art I & II: Engineering and Technology", will be offered in two sections, an introductory level and advanced section. The first section of the course will be structured to offer a broad range of technical knowledge and theoretical perspectives for producing site-specific artworks in the public realm, and will result in a group public art project to be exhibited on campus. The advanced course, to be offered in the Spring semester, will utilize the broad range of public art knowledge and technical ability as students focus on a more dynamic and comprehensive public art projects to be displayed on-campus, or in the community. By structuring the course in beginning and advanced sections we intend to offer the beginning level course in general studies, so that the course will potentially garner interest to a wide range of students.

The scope of our goals and long-term objective is that the new courses offered will contribute to a rotating public art program of student artwork on campus. Showcasing student art on campus through professional means of display (engineered for safety and durability) would have a significant impact on our students, Visual Art and Engineering departments, and the university at large, that we hope will become a permanent fixture. The program would allow successful projects to be exhibited on campus for one-year, providing students with the opportunity to gain valuable experience towards pursuing careers in the public art field. Every year new student artworks will be chosen and mounted for display through an application process. Having the work displayed in this context would draw awareness to both the visual arts and engineering programs, and enrich the cultural experience of the university environment.

The interdisciplinary nature of this course will offer a rich combination of critical thinking, art making, and technological abilities. From the artistic perspective students will gain knowledge of sculpture processes including installation art, metal casting, kinetic sculpture, and extended media in sculpture (the integration of video, projection, or sound with form); as well as theoretical perspectives on site-specificity, interaction, and art as social practice. These artistic explorations will be matched with engineering methodology in material processing, print reading, producing working drawings, CAD modeling, and statics and strength of materials. The culmination of this coursework will equip students with creative, critical thinking skills and the technical ability to realize public artworks possessing structural integrity and environmental consciousness.

In Public Art I: Engineering and Technology, students will learn a range of techniques in creating that are consequential to both Sculpture and Engineering. Several small-scale projects will be conducted as students engage in learning 3D rendering software, such as CAD modeling, (CNC) computer numerically controlled machinery including: routers, plasma cutting, and water-jet cutting. These tools will be used to explore the art of planning and proposal development for site-oriented three-dimensional projects, and creating scaled maquettes for preliminary models. Students will learn new methods in Foundry, including rapid prototyping for mold making and metal casting. A class project will utilize engineering in a project using metal, concrete, and solar technology to produce a multi-media sculpture. Here students will explore the use of solar power technology to produce interactive, light-based, or video-based works of art.

Because of the survey of methods and technology explored in Public Art I, the advanced section of this course will allow students to hone individual skills and interests while developing a more dynamic independently driven, or collaborative, public art project.

Preliminary Evidence:

The efficacy of a cross-disciplinary approach to this topic is evidenced by the regular interactions of artists and engineers to develop public artwork in the professional field. In commissioned public art projects; artists often work with engineers on the planning stage and implementation of an artwork to ensure durability, public safety, and appropriateness for the geographic and environmental conditions of the site. Exploring this subject with students between these disciplines will likely present opportune student collaborations and complimentary interactions for learning. For example, from our teaching experiences engineering students would benefit more by engaging in creative exercises of thinking-out-of-the-box, while art majors will benefit more from interacting with peers on technical and structural elements of three-dimensional artworks. Engaging between art and engineering will merge creative thinking with technological production and increase students' abilities to learn at a faster pace and more dynamic level.

The concept of culminating Art with Engineering would be new to Weber State University, similar programs have been put together at other Universities with success. Universities such as Lehigh University, Arizona State University, and Purdue University, are just some of the universities that have integrated art and engineering. The programs have been successful and have led to fields of research that would not otherwise be possible. While this project is at a much smaller scale previous attempts at combining Art with Engineering have been shown to be very successful.

Implementation:

The project would begin Fall of 2014 for the first course, Public Art I (2720, for 3 credits) while the second course, Public Art II (3720, for 3 credits) would follow in the Spring 2015, semester. The courses would be taught as a series and be the expansion of ART 3720 Public Art into Public Art 1 and Public Art 2. The course would be capped at 24 students due to laboratory space. Both faculty members would be able to teach these courses in-load with their regular teaching duties on an annual basis. These courses would be offered annually with beginning level in the fall and the advanced level offered in the spring semesters. Our goal is to make this a permanent collaboration between sculpture and engineering technology, with the courses offered yearly, and the expectation that our success in bridging the two areas will develop over several years of building the program. The courses would benefit many students in the arts and engineering. There are currently no general courses offered in which engineering has been incorporated and could spark the interest of engineering students as a way to fulfill their general requirements. This has the potential to benefit hundreds of engineering students and similarly those students in the arts that are interested in learning how to produce public art and understanding engineering concepts.

Detailed Assessment plan:

The nature of the two classes proposed allows for several methods for assessing the students. Three major methods of assessing the students learning and understanding of the course material will follow the use of portfolios, peer assessment, and juried presentations. The use of portfolios will be used to determine the students individually by giving them certain public art pieces and having them describe the artistic and engineering techniques used to produce the piece. The portfolio can be used as a tool to assess the students understanding of the topics as well as a method for tracking the students' progression through the class.

The culmination of art and engineering takes two different mindsets and has them working together. To help facilitate and assess student learning, peer assessment will be used. This will allow the students to give helpful comments and evaluation to their fellow students while allowing for one discipline to transfer knowledge to the other and vice versa. This methodology also allows for the instructors to evaluate

the students' effectiveness and understanding of how to evaluate designs or ideas constructively as these are key components to working in Sculpture or Engineering.

The third methodology used for evaluating the outcomes of the courses is to use juried presentations. This will allow for the instructors to directly evaluate the students based on their term projects. The presentations will provide the students opportunities to present their pieces and gives experience presenting to an audience while giving the instructors the ability to evaluate the students on the outcomes of the course. These assessment methods will be used to determine if the learning objective or outcomes for the classes have been met.

Sustainability:

Much of the funding will be sustained by repeated use of technology and equipment, including installation methods such as concrete blocks poured for rotating sculptures that would be placed in front of the Ethel Wattis Kimball Visual Arts Center and the Engineering building. The equipment, including a digital video camera, digital projectors, solar power systems, and foundry equipment, are the bulk expense to be purchased with the award funds, and have a lengthy shelf-life of fifteen years or longer.

Budget Details:

The budget consists of equipment and laboratory supplies to make the project a success. The video camera and projectors are to help teach engineering principles but are needed to produce projections that can be used as public art. The two solar systems are being used to teach engineering principles about green energy while also teaching in a lab setting how to wire up light-based art projects with integrated sensors. The Larger solar systems are to be used for advanced projects for the students to produce light-based sculptures for display on campus. The foundry equipment is used to help teach and allow students the ability to produce metal sculptures for display on campus and to understand that the rapid prototypers can be used to produce molds for metal casting. The lab supplies are used to ensure that the lab activities have the materials needed to allow the students to see how the new technologies such as rapid prototyping can alter the way we think about art or engineering. The consumable supplies will last for up to two years, and help us to experiment and determine the best student learning outcomes. After two years, the consumable supplies will be purchased using a course lab fee, and be a requirement for students to purchase on an individual basis. The concrete pads or bases are necessary for securing students' artworks for outdoor display in public areas as the final outcome of the courses.

Budget:

Equipment:

Sunforce 50048 60W Solar Charging Kit (9@ 253.56)	2,282
Sunforce 37126 260W Crystalline Solar Kit (2@935.50)	1,871
Video camera	1,500
2 Digital projectors outdoor/indoor	2,500
Integrated Sensors	400
Foundry equipment:	444
Crucibles (2@145.50)	
Ladles (2@76.50)	
Safety gear:	1,343
Aluminized coat, (4@59.88)	
Leggings (4@83.00)	
Gloves. (4@93.91)	
Hard hats with face shields (4@99.03)	

Lab supplies:

Rapid prototyping wax:	960
Plastic (2@230.00)	
Wax (1@500.00)	
CNC consumables:	500
Styrofoam	
Sheet metal	
Casting consumables	595
Sand (100lbs@ 95.00)	
Degasser tablets (3@10.00)	
Shell material 375.00	
Foundations for display of artwork:	2,000
Concrete pads and installation structural components- metal and hardware	
Total:	$14,395