

The Ohio State University
First-Year Seminar Program
Course Proposal

Course Information

1. Attach a sample syllabus that includes the following. (Sample syllabi can be found at <http://freshmanseminars.osu.edu>).
 - the course goals
 - a brief description of the content
 - the distribution of meeting times
 - a weekly topical outline
 - a listing of assignments
 - grade assessment information (A-E or S/U)
 - required textbooks and/or reading list
 - the academic misconduct and disability services statements (sample statements can be found at <http://asccas.osu.edu/curriculum/asc-syllabus-elements>)
2. Attach a brief biographical paragraph that includes the current research interests, teaching awards and honors, and undergraduate courses taught by the participating instructor(s). The paragraph will be included in materials for first-year students.

Betty Lise Anderson (Prof.) Department of Electrical + Computer Engineering
Proposer's Name and Primary Academic Unit (please print)

Professor
Proposer's Title

anderson.67@osu.edu
Proposer's e-mail Address

614-292-1323
Contact Phone Number

2/23/17
Submission Date


Approval of Department Chair of Academic Unit (please print)

(Joel Johnson)

Please indicate the semester you would like to offer the seminar: AU SP either semester ok but fall preferred

This form and any attachments should be scanned/e-mailed to bitters.4@osu.edu.

STEM Outreach to K12 Students

ARTSCI 1138.xx

Day TBA

Time and place TBA

Professor Betty Lise Anderson

Department of Electrical and Computer Engineering

200 Caldwell Lab

Course description: Teachers in the K12 school system are constantly needing cool, hands-on activities to teach STEM (Science, Technology, Engineering and Math) topics, but typically have neither the money nor the time to provide them. In this course, you will have the opportunity to visit schools, libraries, and after-school programs to deliver hands-on activities at no cost to the schools. We focus on but are not limited to schools in poor areas where kids just don't get many opportunities to build stuff. We want to show them that STEM is a viable career option. You will write a report on each school visit, reflecting on whether and how your efforts may change someone's life, on the wide range of circumstances kids live in, and the effectiveness of the specific presentation you help with. You will also participate in discussions in class. You may also optionally develop a new project (complete with lesson plans for teachers).

The course will be structured as follows: The first seven weeks we will meet for 55 minutes a week, where you will have the opportunity to learn some of the projects, and we will have speakers come and give pointers how to teach science to various age groups. Meanwhile, there will be a three-hour a week lab. Different sections will be at different times; you sign up for one section that works for your schedule. Then when an event comes up, you will be able to go. The labs happen all semester, but you are only required to attend a minimum of seven events (labs). You will be expected to lead the activity at a minimum of one. The course instructor typically drives so you don't need a car. Usually three or four people go to an event at a time. There are usually three to four events per week so there is plenty to choose from.

You may substitute the development of a new hands-on activity in place of some of the school visits with approval from the instructor.

Grading: Satisfactory/Unsatisfactory

Class participation	30%
Reflections, critiques	50%
Oral presentation	20%

Distribution of meeting times:

Lecture: 55 minutes once a week for first 7 weeks of the semester

Lab: Three-hour lab once a week for entire semester BUT you need only attend any seven that you choose. Lab times are used to visit schools etc.

Course goals:

- Students master scientific principles behind several hands-on projects for K12 students
- Students master presentation of technical content to non-technical audiences
- Students master multiple engineering projects appropriate for a variety of age levels
- Students serve the community and develop an appreciation for service
- Students practice critical skills in writing

Weekly Topical Outline

Week 1: Intro to course, build Circuit Game and Cartesian Diver

Week 2: Learn how a speaker works; build speaker

Week 3: Visiting speaker from Education on talking to kids; discussion

Week 4: Learn how LED flashlight works, build LED flashlight, discussion

Week 5: Learn how wireless energy works, build Wireless Energy Transfer; discussion

Week 6: Learn breadboarding and reading electrical schematics; build LED Display;
discussion

Week 7: Learn how pulse-oxymeter systems work; build Heart Rate Monitor, discussion

Weeks 1-14: Labs (3 hours, one day per week, to visit schools- but you don't have to go every week. Go to at least 7. That makes the time commitment work out for 1 credit hour.

Assignments:

For each visit you attend, you will write a reflection paper (~250 words).

You will critique presentations at actual events (What could have gone better? What was hardest for kids, and why? Was the level of vocabulary use age-appropriate?)

You must be the presenter at a minimum of one event.

You will participate in class discussions.

Disabilities Statement

Any student who feels s/he may need an accommodation based on the impact of a disability should contact the instructor privately to discuss specific needs. Please contact the OSU Office for Disability Services for assistance in verifying the need for accommodations and developing accommodation strategies. If you require accommodation, please let the instructor know at the beginning of the term, and not later than the second Friday, so that if arrangements are needed regarding midterms, there will be time to set them up.

Academic Misconduct Statement

Any student found to have engaged in academic misconduct, as set forth in the Code of Student Conduct Section 3335-23-04, Prohibited Conduct, will be subject to disciplinary action by the university. Academic misconduct is any activity that tends to compromise the academic integrity of the university, or subvert the educational process.

Student Conduct

Students are expected to abide by the provisions in the Code of Student Conduct. The University's [Code of Student Conduct](#) and [Sexual Harassment Policy](#) are available on the OSU Web page

Biographical Statement Prof. Anderson has run the OSU K12 Engineering outreach project for eight years. She has visited over 90 different schools, plus libraries, camps, even pre-schools. The program has reached over 17,000 students to date. It has won many awards, including the Ohio State University Outreach and Engagement Award, the highest award OSU gives in this area. Examples of projects are to build a paper speaker- plug it into your phone and it really plays music, light up your initials in LED lights, build a submarine or a heart-rate monitor. For the complete list, please visit go.osu.edu/K12engineering. Dr. Anderson's research is in photonics (lasers, fiber optics, etc.) and she is a Fellow of the SPIE.