MOLGEN 4581S
"BioEYES: Hands-on STEM learning with zebrafish in Columbus Public Elementary Schools"

Instructor

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Meeting Days and Times and Location

Please note: Students will be required to participate in off-campus activities; some evening/weekend meetings may be required. Orientation and hands-on training sessions will take place during the first two weeks of class. The first week session will be a self-paced (approximately 3-hour) review of online material. The second week session will be an in-person ~3-hour hands-on training session held at time to be arranged that work best with student schedules (possibly in the evening and or on weekends). There will be one 1-hour group meeting mid-semester. Elementary school visits will take place in-person at local Columbus elementary schools, including Cranbrook Elementary and Barrington Elementary. School visits occur Mondays, Tuesdays, and Fridays (and occasional Wednesdays and Thursdays) and last ~3 hours (2 classroom periods/session). Visits are available at variable times during the day between mid-morning to mid-afternoon. Meeting times are thus variable and depend upon the school visit schedule. Students will select 4 school visits (8 classrooms) throughout the semester that work with their schedule. Transportation to and from elementary schools will be provided by carpool with the instructor, course coordinator, and/or other students, unless a student chooses to arrange their own transportation.

Should a student be unable to select school visits that work with their course schedule and wish to drop the course, they are gently reminded to consult with their academic advisor and the financial aid office and to be aware of the following enrollment deadlines:

- Fourth Friday of the Autumn semester: Drop a course online without a "W"
- Tenth Friday of the Autumn semester: Drop a course with a "W" (with an advisor's assistance)

Format of Instruction

This is service-learning course. There is an average of 3 contact hours per week. Most course activities will involve engaging with upper elementary students in the classroom. Students will select 4 school visits (8 classrooms total) throughout the semester that work with their course schedule. In addition to school visits, students will participate in orientation, hands-on training, 1-2 preparatory sessions, and 1 wrap-up session. There is one assignment.

Description of the course

The hands-on science experience provided for upper elementary students in this course is based upon "Project BioEYES", a successful international teaching curriculum that was initially developed in 2002, that has reached >150,000 students and >1,000 teachers across the globe. The Ohio State University is a recognized BioEYES partner site (https://www.bioeyes.org/partner-sites). The Columbus BioEYES program operates as a partnership between Columbus public elementary schools and BioEYES-trained OSU scientists. The program brings a week-long, hands-on science experience into elementary school classrooms; to date, OSU BioEYES has reached 631 upper elementary students in 29 classrooms at 2 different Columbus public schools (Autumn

semesters 2019, 2021, and 2022). OSU students enrolled in this course will help teach the BioEYES curriculum in the elementary school classroom, assisting students with hands-on activities and actively engaging with them as they make observations and generate hypotheses. Students enrolled in this course will learn how to (1) effectively manage a classroom during active learning, (2) design an effective and exciting hands-on curriculum, and (3) interact positively with upper elementary students and their teachers. As a final assignment, students will design and demonstrate a genetics or genomics hands-on activity for the class.

Prerequisites

Prerequisites are BIOL 1113 and an upper division course in a science or science education department, or permission of instructor. All students who are interested in biology and are eager to learn how to communicate biological concepts to elementary school students are welcome.

Required texts and course materials

There is no required textbook. All course materials will be provided at the orientation meeting or posted on the course CarmenCanvas site.

Assignments and Examinations

There are no examinations in this course. Most of the coursework is to participate in 4 elementary school visits (2 classrooms per visit) for a total of 8 classroom sessions. A short reflection will be due one week after each visit. There is one course assignment (a final project). The final project involves designing a hands-on activity for elementary school students that expands upon what they have learned in BioEYES or covers a new topic in genetics and/or genomics. The student will turn in a 1-page description, video, or powerpoint/keynote presentation and demonstrate their activity at our final wrap-up session. These student-designed projects may be incorporated into spring semester BioEYES festivals (where the elementary students whose classrooms we visited come to OSU for a field trip to do additional hands-on science activities), or other outreach programs (OSU WestFest Science and Technology Festival, COSI Big Science Festival, etc.). Students who have taken this course are welcome (but not expected) to participate in outreach activities in future semesters.

Grading Information and Grading Scale

This course is graded S/U. A student will receive an S grade for satisfactory completion of required classroom visits, reflections, and the one assignment. A student will receive a U grade if they do not complete the required number of classroom visits (or perform suitable make-up work; see Course Attendance Policy) or the assignment, or for inappropriate or disruptive behavior in the elementary school classroom (after one warning). The course is repeatable up to a maximum of 3 credit hours.

Scheduling of course meetings and assignment due dates

Hands-on training session: The 3-hour hands-on training session will take place during the second week of class at a time that works for all students enrolled in the course. This may be an evening or weekend. We will set the date and time during the first week of class.

Classroom Visits: Every year the classroom visit schedule is different, so we do not have fixed visit dates and times until the beginning of the semester. Mondays, Tuesdays, and Fridays are BioEYES educator-led days and thus are the days where we will visit classrooms to lead the program. Teachers also often request our presence on Wednesdays and Thursdays, the classroom teacher-led days of the program. The activities performed each day of the week are different, so students are encouraged to participate on different days if their schedule allows.

Mid-semester Check-in: This 1-hour meeting will take place sometime during Weeks 8-10 at a time that works for all students enrolled in the course. This may be an evening or weekend. We will set the date and time during the first week of class.

Hands-on Science Activity assignment: This assignment will be due during the last week of instruction or during finals week at a time that works for all students enrolled in the course. This may be an evening or weekend. We will decide the date and time during the first week of class.

Course Attendance Policy

Students are expected to attend the classroom visit sessions for which they sign up. They should select sessions that do not conflict with their courses, extracurricular activities, or observed religious holidays. In the case of illness, the student should contact the instructor as soon as possible to select another session or arrange another way to make up the missed visit (e.g., participate in extra preparatory sessions).

Week-by-week Course Outline

Week 1: 3-hour self-paced review of (1) the BioEYES website (https://www.bioeyes.org), including video tutorials of BioEYES activities (https://www.bioeyes.org/refreshers), (2) the BioEYES teacher manual, and (3) a short video describing the activities performed each day over the course of the week-long classroom experiment. Complete required online animal use training. Optional activities: Implicit Bias Training (https://kirwaninstitute.osu.edu/implicit-bias-training) and selected readings posted on Carmen.

Week 2: 3-hour session with the instructor and course coordinator to tour the zebrafish facility, perform hands-on activities, discuss effective elementary classroom teaching techniques, review the BioEYES student journal activities, and ask questions.

Weeks 3-15: Visit 8 classrooms (2 classrooms per session) in 4 different school visits. You may spread these visits throughout the semester. Participate in 2 preparatory sessions to assist preparation or cleaning of materials used for classroom activities.

Week 8, 9 or 10: 1-hour mid-semester check-in (time to be arranged)

Week 14/15: Turn in assignment and present your hands-on activity to the class at our final wrap-up session.

COVID-19 policies

The COVID-19 pandemic is still present. Current expectations can be found at the Safe and Healthy Buckeyes site (https://safeandhealthy.osu.edu). If you are ill, or have been asked to self-isolate or quarantine, please do not attend class. If this comes up for you, please contact the instructors as soon as practical to work out how to complete course material. Public health declarations may require us to make changes in our class plans which will be communicated via CarmenCanvas.

Course Continuity Plan during short-term campus closures

Should in-person classes be canceled, we will also cancel elementary school visits. We share updates via CarmenCanvas.

Academic Integrity

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct: http://studentlife.osu.edu/csc/**.**

Religious Accommodations

Our inclusive environment allows for religious expression. Students requesting accommodations based on faith, religious or a spiritual belief system in regard to examinations, other academic requirements or absences,

are required to provide the instructor with written notice of specific dates for which the student requests alternative accommodations at the earliest possible date. For more information about religious accommodations at Ohio State, visit odi.osu.edu/religious-accommodations.

Diversity, Equity, and Inclusion

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them. We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

Mental Health Statement

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life's Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling 614-292-5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at 614-292-5766 and 24 hour emergency help is also available 24/7 by dialing 988 to reach the Suicide and Crisis Lifeline.

Disability services

The University strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let us know immediately so that we can privately discuss options. To establish reasonable accommodations, we may request that you register with Student Life Disability Services. After registration, make arrangements with us as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; https://slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.