Application for Courses or Programming with Experiential Learning (FY 2021-2022)

Instructor (faculty or staff) or program coordinator (faculty or staff) certifying that their academic course or program has embedded activities and/or assignments which meet one or more of the three QEP engagement opportunities must submit the following to the QEP coordinator 30 days prior to the start of the program/activity.
Direct questions to qep@valdosta.edu

Additional information regarding Experiential Learning is located on the QEP website: QEP.valdosta.edu

Principal Instructor or Program Coordinator:	[redacted]
Course Prefix and Number or Name of Program	BIO 3250
If Course, CRN:	[redacted]
If Credit-Bearing Course, Total Credits:	4
Term(s) or Length:	Fa & Spr ng
Estimated Frequency of Offering:	Every semester

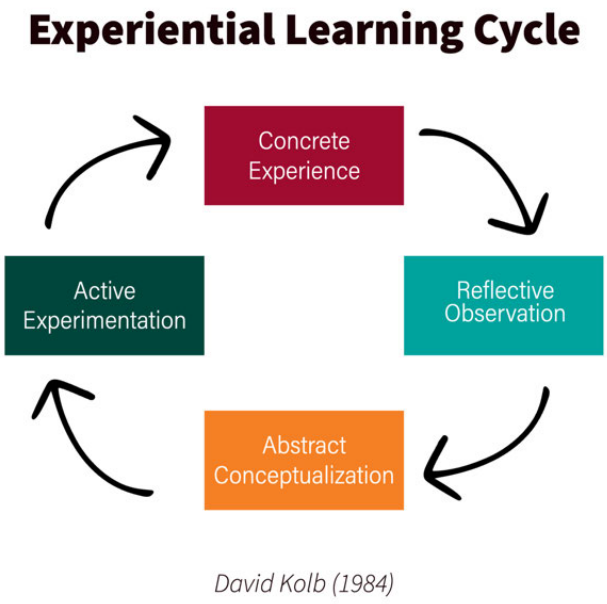
1. Please identify the experiential learning category[ies] for this activity/program:

☑GOAL1= Research and Creative Inquiry

☐GOAL2= Global Citizenship

☐GOAL3= Servant Leadership and Community Engagement

***Please describe the activities associated with each stage of the Experiential Learning Cycle on the next two pages.*



David Kolb (1984)

Concrete Experience

Choose one of the following options that represents the Concrete Experience task for students participating the Experiential Learning activity.

Fieldwork

Describe this task in further detail.

The task for the water quality testing requires both fieldwork to collect water samples and testing of the water prior to the latter assessments. To collect freshwater samples, students will explore the aquatic habitats that run throughout campus and conduct fieldwork at various locations along the One Mile Creek. While collecting water samples, students document the width and depth of the creek at each sampling location using transect tapes that were used in a previous lab. Students will determine if the water bodies are categorized as still or flowing freshwater locations. After being provided with vials for water and various other tools, such as poles, tape, buckets, rope and nets, that can be adapted for collecting different sampling locations, they will need to troubleshoot the best practice for safely completing the task of filling their water vials and measuring the difference attributes of the creek. By allowing them to work as a team to design their own water collecting strategies the students develop problem solving skills and Once they have completed their water collection locations, students develop hypotheses about the potential differences in the water quality parameters across the different sites.

For the second hour of lab, students explore the research labs in Bailey Science Center to collect water samples from research labs with a variety of organisms. Seawater is collected from a coral reef tank, seahorse enclosures, mangrove killifish tanks, and several marine algae cultures. The collection of saltwater is also useful for semesters when the streams are not flowing due to low rainfall so that students can compare their still, non-flowing freshwater samples to the saltwater ones on campus.

For the final hour of lab, students learn how to measure different abiotic parameters of the water including pH, nitrates, phosphates, calcium, and salinity. This process teaches students how to accurately measure reagents, the process of titration, and introduces them to refractometers and specific gravity meters for conducting water quality analyses. Each student contributes the results of their water quality testing to the class data set for the short reports.

Reflective Observation

Choose one of the following options that represents the Reflective Observation task for students participating the Experiential Learning activity.

Short Reports

Describe this task in further detail.

To determine the comparisons between collecting locations and reflect upon the how to visualize the differences between the survey locations the students are required to conduct several statistical tests and produce graphical representations of their data. This component of the course utilizes the skills they have been developing throughout the course because the students need to critically think about what type of graphs and statistical tests are appropriate for their samples given the nature of their data collection. The assignment is submitted and graded upon the student's completion of the correct graphs and output of the statistical tests using the expectations for these skills established in previous graphing assignments throughout the course.

The freshwater sampling can be organized into two categories, either moving or still water bodies; therefore, the students will create a column graph with the categorical data on the x-axis and the continuous parameters, such as phosphates, nitrates, and pH on the y-axes of their graphs, using the averages for the columns of each category. They will need to calculate standard error to add error bars for their graphs and can conduct a t-test to statistically compare the locations for each water quality parameter. They will then determine if the results support their null or alternative hypothesis.

For the saltwater samples, students will identify that the independent variable for the data set is the salinity variable. This is allow the students to create a scatter plot graph with the salinity as a continuous variable on the x-axis and the continuous water quality parameter on the y-axis. Students will determine the relationship between the variables using the linear regression line's slope and R squared value. The salt concentrations will range from salinities of 0 for freshwater samples, to estuarine levels of 25 ppt for seahorses found in seagrass beds, to a maximum of 35 ppt salt for the coral reef tank. The killifish can has very variable salinities due to the nature of their home, the mangroves that have either high levels of rainwater entering the coast (15ppt) or hyper-saline salinities during dry seasons (40ppt). The collection of water samples from species found in different ecological biomes will reinforce the concepts covered earlier in the course about how ecosystems vary in abiotic factors, such as salinity.

Abstract Conceptualization

Choose one of the following options that represents the Abstract Conceptualization task for students participating the Experiential Learning activity.

Summaries

Describe this task in further detail.

After completing the fieldwork and reflective observation, students will write a final interpretation of their results that explain the biological rationale behind the outcomes of their statistical analyses and figures, both tables and graphical representations of their data. They will need to research where the results for each of their water quality parameters from their sampling fall within the range of other natural systems.

As a part of the water quality lab summary, students will have to introduce the concept of eutrophication, give examples of this phenomenon occurring in nearby aquatic communities, and explain which water quality parameters that we have measured are associated with the process of eutrophication. This will require students to find, read, and cite peer reviewed publications using case studies that document excess nutrients, such as nitrogen and phosphorus, being added to aquatic systems that resulted in algae growth and changes in their system's food web. Their papers will outline how nutrients causing algae blooms, such as red tide, can negatively affects other organisms. They will need to determine if the water bodies tested in our local surveys are at risk of algae blooms and what actions they will need to take as scientists to protect our local waters. Assignments are turned in via blazeview using turn-it-in for plagiarism checks to ensure that students are able to paraphrase other case studies results correctly. Grading is based up on correct interpretation of their graphical and statistical results, the student's ability to connect their findings with other studies, and the use of appropriate citations, both in the text and at the end of their summary.

Active Experimentation

Choose one of the following options that represents the Active Experimentation task for students participating the Experiential Learning activity.

Simulations

Describe this task in further detail.

For the final component of the project, students will be using the computer simulation called " Nutrient Pollution" by SimBio software to put the results from their campus water quality samples in context with other natural ecosystems. SimBio is a simulation platform that allows students to learn more about the role of excess nutrients entering into aquatic ecosystems that are introduced by runoff from human activities, such as fertilizer, oil changes, and pesticides. During the simulation we talk through the different scenarios they are testing that can affect all levels of the food web when animals are exposed to toxins or if nutrient pollution leading to eutrophication occurs.

The simulations provide students with the opportunity to apply the knowledge they gained from their previous local fieldwork, analyses, and interpretations by entering the data from their water quality collection into the simulations. For example, in one of the scenarios they can look at the predicted effects on the campus wildlife when they enter the levels of nutrients they measured in the local water systems into the simulation. They are also able to determine what level of nutrients would be problematic for our campus water systems if pollution increased to connect their data with predictions for the future. Students test in the simulation what the best approach to counteract these nutrients would be to learn about how we could mitigate pollution effects on campus. The skills gained from this activity are useful for students who want to pursue careers in Fish and Wildlife management or even just those who want to have home aquariums.

By conducting this project every semester, we will be able to monitor the levels of nutrients in our local water systems and allow us to monitor water quality parameters of One Mile Creek on the VSU campus. Developing a long-term data set will help to identify any problematic changes to the water quality and aid in protecting the fish, turtles, birds, and other wildlife that inhabit our campus waters.

2. I agree to have student participants submit the **written reflections** about the opportunity using the instruments provided by the QEP Coordinator.
   - ■ Yes
   - ☐ No
3. I agree to score the student written reflection using the rubric provided and provide that information to the QEP Coordinator 30 days after completing the learning opportunity.
   - ■ Yes
   - ☐ No

4. I agree to write an instructor or program coordinator reflection about this experiential learning activity and provide it to the QEP Coordinator 30 days after completing the learning opportunity. [1-2 max pages]
   - ■ Yes
   - ☐ No

5. A) If credit-bearing course, USG-approved attributes will be assigned to the course in Banner for the term specified. Mark those codes below for which you believe best describe the learning to take place in the course.
   B) If program or non-credit-bearing course, identify the total contact hours for the experiential learning opportunity _____

   Service Learning. Courses that (1) require student participation in service projects or community engagement (either on campus or through institutional partnerships with off-campus organizations) and (2) integrate the service experience into the course content
   - ☐ ZSL1= Service learning courses that require 10 or less hours of service
   - ☐ ZSL2= Service learning courses that require 11 to 20 hours of service
   - ☐ ZSL3= Service learning courses that require 21 to 50 hours of service
   - ☐ ZSL4= Service learning courses that require 51 or more hours of service

   Undergraduate Research or Creative Project. Courses that are primarily focused on an undergraduate research experience where the students conduct an original research or creative project
   - ▣ ZUR1= Research or creative project requires 30 or less contact hours
   - ☐ ZUR2= Research or creative project requires 31 to 50 contact hours
   - ☐ ZUR3= Research or creative project requires 51 to 100 contact hours
   - ☐ ZUR4= Research or creative project requires 101 or more contact hours

Work-based Learning. Courses that (1) require for-credit internships, practicums, clinicals, co-ops, or similar work-based experiences and (2) integrate the work experience into the course content.

☐ZWL1= Work-based component requires 30 or less contact hours
☐ZWL2= Work-based component requires 31 to 50 contact hours
☐ZWL3= Work-based component requires 51 to 100 contact hours
☐ZWL4= Work-based component requires 101 or more contact hours

Capstone.

☐ZCAP= Course offered to undergraduate students to capture a culminating project or exhibition (e.g., a thesis, performance, project) that serves as a final academic experience.

Study Abroad

☐ZSAB= Study Abroad (The course is taught outside of the United States and results in progress towards a degree at the student's home institution)
☐ZSAW= Study Away (The course is similar to Study Abroad in that it generates similar educational, learning and development objectives by teaching students to think, reflect upon themselves and interact with others but it is taught within the United States in a location significantly different than the home campus.)

Identify the duration of the trip (not the length of the course):

☐ZSA1= Less than 2 weeks
☐ZSA2= 2 to less than 4 weeks
☐ZSA3= 4 to less than 8 weeks
☐ZSA4= At least 8 weeks but less than a full semester
☐ZSA5= One semester

Identify other applicable components about the study abroad/study away experience:

☐ZSAC= Faculty Led (The course is taught by a faculty member at your institution who is leading the trip)
☐ZSAD= Branch Campus Abroad (The course is taught at a USG's branch campus abroad such as the sites in Costa Rica, Cortona, Oxford, Montepulciano)
☐ZSAE=Embedded (The course is partially taught on the USG campus, and partially taught abroad, such as courses with a trip over Spring or Winter Break)
☐ZSAF=USG Consortium Study Abroad (The course is taught as part of one of the USG World Regional Council Study Abroad trips, such as European Council and Asia Council trips)
☐ZSAG=International Service Learning (credit bearing volunteering, community development and/or other related educational experience abroad)
☐ZSAH =Internship Abroad/Away (credit bearing work experience abroad)
☐ZSAI =Research Abroad/Away (credit bearing research experience abroad, self-organized or sponsored)

6. Please mark which skills that a student will learn more about and experience through participation in this course:
   - ☑ Problem-Based Learning
   - ☐ Explore Cultural Differences
   - ☐ Explore Individual Differences
   - ☐ Reflect and articulate personal growth and development
   - ☐ Take initiative and make decisions while being held accountable
   - ☑ Reflect and articulate development of knowledge
   - ☑ Reflect and articulate development of skills
   - ☐ Reflect and articulate development of values

**When you have reached this point, please email your application (i*ncluding the Defining Experiential Learning Activities in Your Course or Program document*) along with the names of your Department Head and Dean to the QEP Coordinator at qep@valdosta.edu with the subject line: *Application for Courses or Programming with Experiential Learning*. Any revisions or questions can be addressed at this stage. The QEP Coordinator will conduct an initial review of the application within 10 days. The approval process will be completed using Docusign after an initial review of the application.

7. Approval of Department Head: _____ Date: _____

   Approval of Dean/Director: _____ Date: _____

   Approval of QEP Coordinator: _____ Date: _____