Affordable Materials Grants, Round 20:

Transformation Grants

(Fall 2021-Fall 2022)

Proposal Form and Narrative

# Applicant and Team Information

| Requested information | Answer |
| --- | --- |
| Institution(s) | Dalton State College |
| Applicant name | Christopher Wozny |
| Applicant email  | cwozny@daltonstate.edu |
| Applicant position/title | Associate Professor of Chemistry and Physics |

Please provide the first/last names and email addresses of all team members within the proposed project. Include the applicant (Project Lead) in this list. Do not include prefixes or suffixes such as Ms., Dr., Ph.D., etc.

| Team member | Name | Email address |
| --- | --- | --- |
| Team member 1 | Christopher Wozny | cwozny@daltonstate.edu |
| Team member 2 | Rebecca Brosky | rbrosky@daltonstate.edu |
| Team member 3 | Eric Crisp | rcrisp@daltonstate.edu |
| Team member 4 | Amanda Smith | asmith@daltonstate.edu |

# Project Information

| Requested information | Answer |
| --- | --- |
| Priority Category / Categories | *Departmental Scaling Projects**Please note: Departmental Scaling Projects applications require the department to commit to implement the resources for at least the Final Semester of the project.*  |
| Requested Total Amount of Funding | *$8,000* |
| Final Semester of Project | *Fall 2022.*  |
| Using OpenStax Textbook? | *Yes* |

# Impact Data

## Course 1

| Row # | Requested information | Answer |
| --- | --- | --- |
| N/A | Course title and number | CHEM 1211k |
| N/A | Course instructors | Akdeniz, Brosky, Crisp, Shim, Wozny, Hagberg |
| 1 | Average number of students enrolled per section | 20 |
| 2 | Average number of affected course sections scheduled in a summer semester | 1 |
| 3 | Average number of affected course sections scheduled in a fall semester | 8 |
| 4 | Average number of affected course sections scheduled in a spring semester | 5 |
| 5 | Total number of course sections scheduled in an academic year  | 14 |
| 6 | Total number of student section enrollments per academic year | 280 |
| 7 | Original required commercial materials | OpenStax Chemistry, 2e |
| 8 | Original cost per student section enrollment | $ 0 |
| 9 | Average post-project cost per student section enrollment | $ 0 |
| 10 | Average post-project savings per student section enrollment | $ 0 |
| 11 | Projected total annual student savings per academic year | $ 0 |

## Course 2

|  |  |  |
| --- | --- | --- |
| Row # | Requested information | Answer |
| N/A | Course title and number | CHEM 1212k |
| N/A | Course instructor | Akdeniz, Brosky, Crisp, Shim, Wozny, Hagberg |
| 1 | Average number of students enrolled per section | 20 |
| 2 | Average number of course sections scheduled in a summer semester | 1 |
| 3 | Average number of course sections scheduled in a fall semester | 3 |
| 4 | Average number of course sections scheduled in a spring semester | 7 |
| 5 | Total number of course sections scheduled in an academic year  | 11 |
| 6 | Total number of student section enrollments per academic year | 220 |
| 7 | Original required commercial materials | OpenStax Chemistry, 2e |
| 8 | Original cost per student section enrollment | $ 0 |
| 9 | Average post-project cost per student section enrollment | $ 0 |
| 10 | Average post-project savings per student section enrollment | $ 0 |
| 11 | Projected total annual student savings per academic year | $ 0 |

# Narrative Section

## 1. Project Goals

The goal of the project is to create laboratory manuals for the Principles of Chemistry course sequence, CHEM 1211k / CHEM 1212k. The manuals will be in an electronic (Word) format and an on-line format accessible to all students enrolled in the courses. The on-line format will include embedded photos and video clips filmed in the Dalton State chemistry laboratory as well as sample data and calculations.

## 2. Statement of Transformation

The chemistry program at Dalton State College has grown significantly over the last eight years since the opening of the new science building, Peeples Hall, in 2014. In 2013, the institution employed four full-time chemists who taught eight sections of Principles of Chemistry I (CHEM 1211k) serving 65 students. Since then, the College has added two full-time tenure-track positions in Chemistry and enrollment in CHEM 1211k has risen to as many as 350 students served in seventeen sections in an academic year. Similar growth has occurred for CHEM 1212k, Principles of Chemistry II.

Before the science building construction, the Chemistry Program had two laboratories for all courses, both lower and upper division. Peeples Hall currently houses five chemistry laboratories dedicated to the undergraduate program, and three research labs for its Chemistry faculty.

With growth comes growing pains. In 2013, instructors of the general chemistry sequence had the option to select a textbook other than the recommended one. Instructors selected their own labs: they often chose a personal version instead of the recommended weekly experiment.

Changes began the occupation of Peeples Hall, although not immediately. An important driving force was concern for the Chemistry Laboratory Coordinator. The laboratory instructors didn’t want to add undue stress to her job, i.e., setting up and tearing down different labs and keeping track of separate waste streams for a dozen lab sections each week. It took a few years to adjust the general chemistry lab schedule so that one course has its labs for the first part of the week in the shared lab space and the second course in the second half.

Communication and consistency among the chemistry faculty is better than before but the transformation isn’t complete. We have adopted OpenStax Chemistry as the text for the course sequence and have agreed upon a sequence of weekly experiments for each course that is reviewed annually. Despite these changes, there are still inconsistencies that can be a challenge to our students.

Instructions for experiments are located on SharePoint that each instructor can download, print, and disseminate to their students independently. As a result, students are often given the experiment for that week when they show up for lab. Because the collection of experiments has grown organically over time, the structure, language, expectations and even the font for each experiment can vary widely. Procedural errors sometimes occur in the documents which aren’t discovered until students are performing the lab. There currently is no mechanism in place to correct errors in the original document for all instructors and future laboratory offerings. It is our hope this grant will rectify these deficiencies.

## 3. Action Plan

The team will meet weekly during the Spring 2022 semester and into the summer as needed for 1-2 hours to prepare materials and review progress. The new manuals will include 12 experiments that are currently used for the course sequence, 10 class-tested labs that are currently used in another physical science course, and 8 experiments that have been used in other chemistry courses but not at Dalton State.

Team members will share responsibilities but leadership for primary tasks will be as follows:

* Dr. Wozny wrote 6 of the experiments currently included as chemistry experiments as well as the 10 that will be incorporated into the new manual. He will be responsible for producing laboratory instructions for the eight experiments that are not currently part of the curriculum.
* Dr. Brosky will be primarily responsible for editing course documents. The goal is to create a series of labs with clear, simple instructions and consistent structure, language, and style.
* Mr. Crisp will take the lead in reviewing experimental procedures for accuracy by conducting the lab as a student would, noting any discrepancies between the instructions and experimental technique, and vague or unclear instructions.
* Ms. Smith, as Chemistry Laboratory Coordinator, will be responsible for creating waste labels for each experiment. She will also provide her knowledge and expertise on the choice of chemical reagents and procedures to reduce chemical waste and enhance laboratory safety.
* Dr. Wozny will be responsible for photographs and video clips of the experiments and creating web pages for each experiment: tasks he is familiar with from other on-line lab manuals he has produced (I.e., https://physics.exploring-physical-science.site).

We plan on preparing thirty experiments, or fifteen for each course. The time needed for editing, testing and documentation will depend on the experiment, but we expect the project will take around 50 hours to complete.

## 4. Quantitative and Qualitative Measures

If funded, the Department will employ a laboratory survey for the CHEM 1211k and CHEM 1212k sections at the end of the Spring 2022 semester on the last day that each class meets. The first section of the survey will be ten multiple choice questions designed to measure student retention of experimental procedures and significant results for labs conducted that term. The labs will also be taught in Fall 2022. The second section of the survey will include five questions on student satisfaction using a Likert scale, and free response questions concerning their perceptions of the strengths and weaknesses of their laboratory experience. The same survey instrument will be administered in each lab section at the conclusion of the Fall 2022 term.

Data on DFWI rates for all courses taught at Dalton State College is already collected by the Academic Affairs office.

## 5. Timeline

The team will meet weekly during the Spring 2022 semester. By focusing on two experiments per week or one per course, we should be able to complete the manuals by the end of the semester, although we will have the option of continuing the work into May and the summer term.

The final report will be submitted by December 15, 2022, after the laboratory manuals are used for course instruction and data is collected for the qualitative and quantitative measures at the completion of the Fall term.

## 6. Budget

The budget for the project is the stipends of $2000 for each team member, or $8,000 for the project. For a 50-hour project, this is equivalent to $40/hr for our expertise.

## 7. Sustainability Plan

The Dalton State chemistry faculty meets once a year to discuss the CHEM 2211K/ CHEM 2122k lab sequences. Since the lab manuals are being produced internally, team members will incorporate revisions to the documents or develop new experiments suggested by faculty for the laboratory section of the courses.

# Creative Commons Terms

*I understand that any new materials or revisions created with ALG funding will, by default, be made available to the public under a Creative Commons Attribution License (CC-BY), with exceptions for modifications of pre-existing resources with a more restrictive license.*

# Accessibility Terms

*I understand that any new materials or revisions created with Affordable Learning Georgia funding must be developed in compliance with the specific accessibility standards defined in the Request for Proposals.*

# Letter of Support

*The Department Chair from the corresponding project, or the Department Chair’s direct report such as the Dean or Provost, must provide a signed Letter of Support for the project. This letter should acknowledge the following:*

* *The department will provide support for fund disbursement in correspondence with the Grants/Business Office.*
* *The department approves of the work on the proposal by the applicant(s).*
* *The department acknowledges the sustainability of the use of these affordable resources after the grant work is complete.*

*In the case of multi-institutional affiliations, all participants’ institutions must provide a letter of support.*

*Please provide the name and title of the department chair (or other administrator) who provided you with the Letter of Support.*

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| Dr. Tricia Scott, Professor of Chemistry and Chair, Physical Sciences Department |

# Grants or Business Office Acknowledgment Form

*Institutional Grants/Business Offices will be responsible for fund disbursement, often in correspondence with the Department Chair, including expense and travel reimbursement. All applicants will need to provide a signed Acknowledgement Form, the template for which is linked on the RFP page, stating that the Grants/Business Office knows about the applicant’s intent to apply for an Affordable Materials Grant. Either the Department Chair or the Project Lead can work with the Grants/Business Office to get this signed form.*

*In the case of multi-institutional affiliations, all participants’ institutions must provide this form.*

*Please provide the name and title of the grants or business office representative who provided you with the acknowledgement form.*

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| Mr. Nick Henry, Vice President for Fiscal Affairs |