Affordable Materials Grants, Round 18:

Continuous Improvement Grants

(Fall 2020 – Fall 2021)

Proposal Form and Narrative

# Notes

* The proposal form and narrative .docx file is for offline drafting and for our review processes. Submitters must use the online Google Form for proposal submission, including uploading this document.
* The only way to submit the official proposal is through the Google Form. The link to the online application is on the [Round 18 RFP Page](https://www.affordablelearninggeorgia.org/about/rfp_r18).
* The italic text provided below is meant for clarifications and can be deleted.

# Applicant and Team Information

|  |  |
| --- | --- |
| Requested information | Answer |
| Institution | University of West Georgia |
| Applicant name | Anne Gaquere Parker |
| Applicant email | agaquere@westga.edu |
| Applicant position/title | Professor of chemistry |
| Submitter name |  |
| Submitter email |  |
| Submitter position/title |  |

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.

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| --- | --- | --- |
| Team member | Name | Email address |
| Team member 1 | Chemera Ivory | civory@westga.edu |
| Team member 2 | Jubilee Ojibo | jojibo1@my.westga.edu |
| Team member 3 |  |  |
| Team member 4 |  |  |
| Team member 5 |  |  |

Project Information

| Requested information | Answer |
| --- | --- |
| Type of Project | · *Other:*   * *Transforming the second course in a chemistry sequence where the first course is already an existing OER course* |
| Requested Amount of Funding  *$10,000 maximum total award per grant* | *$5,000* |
| Course Titles and Course Numbers | Survey of Organic Chemistry and Biochemistry for pre-allied health majors, CHEM1152 |
| Final Semester of Project | * *Summer 2021* |
| Currently Existing Resource(s) to be Revised/Ancillaries Created  *Please provide a title and web address (URL) to each of the currently existing resources that you are revising, creating new ancillary materials for, or replacing. If replacing, please include a title and web address (URL) to the new OER as well.* | The first course in the sequence was transformed thanks to a textbook transformation grant and more materials were created through a mini-grant. The work done through this new continuous grant will be added to the existing libguide.  <https://libguides.westga.edu/OER/NoCostCourses> |

# Project Goals

At the University of West Georgia (UWG), pre-allied health majors (pre-nursing) have the choice of taking a year-long introductory science course either in biology or chemistry. Once they have successfully completed this requirement, they move on to taking additional biology courses. Students who choose to take the introductory biology sequence are thus never exposed to any chemistry. In order to attract more students in the chemistry sequence (Survey of Chemistry I and II, CHEM1151 and CHEM1152), the team was successful in obtaining funds to lower the first course in the sequence (all sections) through the ALG grant program.

This new project aims to transform the content in all the sections of the second course of this year-long sequence in chemistry designed for pre-allied health majors (Survey of Chemistry II, CHEM1152), as taught on the main campus in Carrollton and on the satellite campus in Newnan. The transformation of the first course in the sequence (Survey of Chemistry I, CHEM1151) was funded by this grant program during the “Round 12” and was successfully completed. It led to the creation of ten chapters, heavily edited from Openstax to match the expected level of the course and provide the relevant health-based examples for allied health majors. All course materials are currently being used exactly as planned in the grant proposal. Furthermore, a mini-grant was funded in “Round 17” to add ancillary materials such reading guides and solved problems to the work already completed for CHEM1151. This project is currently ongoing.

The goals of this new continuous project are as follows:

Goal 1: Reduce the cost of course material by 83% for this 2nd course in the sequence;

Goal 2: Ensure that students have access to course materials from the very beginning of the semester, including online graded homework using a commercially platform (Alta, formerly known as Knewton) at a negotiated rate;

Goal 3: Reorganize the available LibreTexts course materials to match how the course is taught;

Goal 4: Create active learning assignments to supplement the text in order to increase students’ engagement and increase their preparedness as they apply to be admitted in highly competitive nursing programs;

Goal 5: Increase student engagement by including renewable assignments into the course design;

Goal 6: Improve student success (as measured by an increase in scores on the final mandatory examination that is a standardized test written by the American Chemical Society, a decrease in the DFW rates for the course, and an increase of B versus C grades which is the minimum grade required to take the next mandatory biology courses for this major).

# Action Plan

As mentioned earlier, transformation of CHEM1151 was funded, as well as a mini-grant afterwards, and we rewrote relevant parts of the textbook, which focuses on general chemistry, added health-related examples, and created ancillary materials, before sharing with the students on the course learning management system. A Libguide was created in order to widely disseminate our work as shown in the link below:

<https://libguides.westga.edu/OER/NoCostCourses>

Implementation in the classroom (CHEM1151) started occurring in fall 2019 with a student enrollment of 70 students (less than initially projected, probably due to the lack of available seats in the mathematics co-requisite course, and we hope this to be a one-time situation as the trends for the past two decades have shown). The current fall enrollment in CHEM1151 is about 100 students and we hope this uptick will continue and help populate the CHEM 1152 spring 2021 course, which this proposal is written for. Former and current students are already spreading by word of mouth that the chemistry course is now a low-cost course, thus helping with recruiting. The CHEM 1152 course is now being offered only in the spring, which makes the timing of this call for proposals perfectly aligned with our need to create materials this fall before spring 2021 implementation (all sections).

At UWG, in order for pre-allied health majors to move on to the mandatory biology courses, they have to earn a B or higher in their chemistry sequence. Consequently, for improved student success, the grade distribution between Bs and Cs matters just as much as lowering DFW rates. Please see the table below the grade distribution averaged over the past 2 years for CHEM 1152 (data are consistent over many years).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Grade distribution | A% | B% | C% | D% | F% | W% | WF% |
| CHEM 1152  N=297 students | 11% | 31% | 31% | 8% | 3% | 14% | 2% |

An important contributing factor to the grade distribution is purely financial: A sizable fraction of the students simply cannot afford the textbook ($240). Students enrolled in this class refrain from buying the mandatory textbook until after the second exam (midterm point), at which time it is already too late to be truly successful. To avoid this, the lead instructor now requests that the students purchase access to an online homework, provided by Alta (formerly known as Knewton), a commercial platform. Students purchase the Alta package to get access to the graded mandatory homework, which also includes adaptive learning assessments and tutorials. As seen in the attached letter, Alta, a company now owned by Wiley, has committed to provide my students access for less than $40 a semester. It is important to add here that most of our students are Pell eligible (approximately 52% of our student population), and have expressed concerns to the instructor (PI) in the past about buying an expensive textbook, either creating a financial crisis elsewhere in their lives, or simply forgoing this purchase altogether. Since implementing the $40 access to Alta in CHEM1151, the instructor has not heard one student complain about the cost of the course. Students will still have to complete a graded and adaptive homework system through Alta, which has mentioned above agrees to keep the cost at slightly less than $40 (please see attached letter). Alta’s homework system has a proven record of improving student success at other institutions and in various disciplines, including chemistry, as described in a report published by Johns Hopkins University (<https://www.knewton.com/results/>).

Therefore, we propose to continue this successful strategy and replace the textbook used for Survey of Chemistry II with an open access textbook so that all students can get access to the text from day one of the semester. The current LibreTexts textbook (created by UC Davis and under a Creative Commons license, identical to Openstax) provides a good platform to begin with, but some changes need to occur so that it matches the course as taught at UWG as detailed below.

The team is composed of two faculty members: one from chemistry, Dr. Gaquere-Parker and sole instructor for all sections of this chemistry sequence and one from the library, Professor Ivory, MLIS, has an expertise in the development and implementation of open education resources. She has served as ALG Library Champion for over three years and advised on numerous textbook transformation projects. In addition, an undergraduate pre-nursing student, Jubilee Ojibo, who took this sequence of courses last year, and who is the current supplemental instruction leader for CHEM1151 and who will continue on in this role in the Spring for CHEM1152, will be hired to help with the implementation of this project.

The team has identified 6 major tasks as follows:

1. Identifying chemistry content within LibreTexts as detailed in the section below and coordinating textbook customization as well as ensuring accessibility and discoverability (Dr. A. Gaquere-Parker and Professor Ivory) ~ 20 hours
2. Identifying appropriately licensed content, training student worker on how to identify open content and interpret open licenses as well as update the digital textbook (Professor Ivory and Jubilee) ~ 50 hours each
3. Creating active learning activities anchored in allied health disciplines, making the course content relevant to the student population (Jubilee and Dr. A. Gaquere-Parker) ~ 50 hours each
4. Organizing the creation of renewable assignments as the course is being taught (Dr. A. Gaquere-Parker and Professor Ivory) ~ 20 hours
5. Assessment (Dr. A. Gaquere-Parker and Professor Ivory) ~ 10 hours each
6. Dissemination (Dr. A. Gaquere-Parker and Professor Ivory) ~ 10 hours each

Explanation for tasks 1 and 2: LibreTexts provides access to different textbooks and we chose the one written by Ball: “The Basics of GOB Chemistry”. GOB stands for General, Organic and Biochemistry, which is a colloquial name for chemistry for pre-allied health majors. The content is already geared towards pre-nursing majors. The order of the chapters in the Ball textbook does not exactly align with the content and order of the course as taught at UWG, so we will create a new LibreText for UWG students aligning each part of the Ball textbook to the corresponding chapter being taught. Students will benefit from a customized digital textbook that provides easy access to the corresponding reading. Professor Ivory will coordinate the production and publishing of the new digital textbook.

New chapter 1: Intro to Organic Chemistry - Hydrocarbons

Linked to LibreTexts chapter 12: Organic Chemistry – Alkanes and Halogenated Hydrocarbons and Chapter 13: Unsaturated Aromatic Hydrocarbons

New chapter 2: Alcohols and Ethers

Linked to LibreTexts chapter 14: Organic Compounds of Oxygen

New chapter 3: Aldehydes and Ketones

Linked toLibreTexts chapter 14: Organic Compounds of Oxygen

New chapter 4: Carbohydrates

Linked to LibreTexts chapter 16: Carbohydrates

New chapter 5: Carboxylic Acids, Esters

Linked to LibreTexts chapter 15: Organic Acids and Bases and Some of their Derivatives

New chapter 6: Lipids

Linked to LibreTexts chapter 17: Lipids

New chapter 7: Amines, and Amides

Linked to LibreTexts chapter 15: Organic Acids and Bases and Some of their Derivatives

New chapter 8: Proteins and Enzymes

Linked to LibreTexts chapter 18: Amino Acids, Proteins and Enzymes

New chapter 9: Nucleic Acids

Linked to LibreTexts chapter 19: Nucleic Acids

New chapter 10: Metabolism

Linked to LibreTexts chapter 20: Metabolism

Explanation for task 3: Several solved problems with a health-related context as well as questions to help with the students’ conceptual understanding will be created. It is very important to offer students ways to engage deeply with the course material and the use of active learning assignments will accomplish this important goal.

Explanation for task 4: This project also allows our team the opportunity to build renewable assignments into the course design. Having students actively contribute as knowledge creators instead of operating as passive recipients of information will add another dimension to the learning experience. Research shows students that participate in this high-impact practice are more likely to be engaged in the class and experience a sense of agency in their learning process. We will take advantage of open pedagogical practices while strengthening the effectiveness of open course materials by encouraging students to become collaborators.

Explanation for task 5: Assessment: For this continuous improvement grant, the directly accessible quantitative data will include: a) Course DFW rates, b) student scores on the final exam written by the American Chemical Society (ACS), c) course C rates, and d) the percentage of students directly continuing to Microbiology the following course for pre-allied health majors and that requires a B or higher in chemistry.

Explanation for task 6: Dissemination: It is anticipated that this project, if funded, will lead to several presentations at statewide STEM and STEM education conferences, including the Innovations in Pedagogy conference held annually on the University of West Georgia campus in May, as well as the Annual Pedagogy Conference in Athens. The work will also be shared as a public and searchable Libguide for large dissemination, as we have created for CHEM1151. The team is familiar with the IRB process, and an IRB approval was already obtained for the previous iterations of the grant and a new IRB application will be submitted to continue this work and its dissemination if this project is funded.

The PI of this proposal, Dr. Gaquere-Parker, has been the lead instructor for the first semester of this sequence for 15 years and is slated to teach the second part of this course in spring 2021 and annually after that, like she did every spring prior to 2013. Therefore, she will be responsible to update the course materials as needed after the grant period has ended. To the best of our knowledge, this would be the first example of an open access yearlong chemistry sequence for pre-allied health majors in the University System of Georgia, a chemistry sequence that is taken by hundreds of students across Georgia every year, sharing the same course content all over the State.

Finally, this project, if funded, will affect the number of qualified applicants for nursing school and the overall number of graduates in this field, addressing the shortage of trained professionals in the nursing field. This broader impact of this project for the local community and the State of Georgia is therefore quite significant.

# Timeline

- November, 2020:

* Hiring of undergraduate student (currently SI leader for courses: Jubilee Ojibo)
* Training of student

- December, 2020:

* Creation of course material (active learning activities)

- Spring, 2021:

* Use of all created materials
* Revision of created materials as needed during implementation
* May, 2021:
* Data analysis from final exam scores and course grade distribution
* July, 2021:
* Write and submit final report

# Budget

Request: $5,000

- $4,000: The two faculty members will receive $2,000 each for their work on the grant as described in this proposal

- The undergraduate student will receive $1,000. To accomplish this level of work, the student has to display certain skills and be very familiar with the subject matter. Therefore, as our UWG guidelines allow, the student position will be classified as “Student Assistant III” which includes duties “of a complex nature, requiring extensive prior knowledge, skill, or training. [...] Typical Job Duties of a Student Assistant III may include some of the following: [...] data analysis, [...] develop content and graphics, [...] prepare teaching resources [...]” (<https://www.westga.edu/student-services/careerservices/student-employment/paying-student-employee.php>)

In this job category, the student can earn from $9 to $11 with a median of $10, which is the hourly rate chosen for this work. We expect the student to work 100 hours total, unevenly distributed from November to April (the end of the semester). The student will probably be required to spend more time at the onset of the project (November, December, January).

# Creative Commons Terms

*I understand that any new materials or revisions created with Affordable Learning Georgia 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*](https://www.affordablelearninggeorgia.org/about/rfp_r18)*.*

# 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 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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| **Dean Pauline Gagnon** |

# Grants or Business Office Letter of Acknowledgment

*Institutional Grants/Business Offices will be responsible for fund disbursement, often in correspondence with the Department Chair, including expense and travel reimbursement. Applicants will need to provide a short Letter of Acknowledgment 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 letter.*

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

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

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| **Associate Vice President for Research, Dr. Denise Overfield** |