



- Textbook Transformation Grants, Round Fourteen
 - (Summer 2019 –Summer 2020)
 - Proposal Form and Narrative

• Notes

- · The proposal form and narrative .docx file is for offline drafting and review. Submitters must use the InfoReady Review online form for proposal submission.
- · The only way to submit the official proposal is through the online form in Georgia Tech’s InfoReady Review. The link to the online application is on the [Round 14 RFP Page](#).
- · The italic text we provide is meant for clarifications and can be deleted.

Applicant, Team, and Sponsor Information

The **applicant** is the proposed Project Lead for the grant project. The **submitter** is the person submitting the application (which may be a Grants Officer or Administrator). The submitter will often be the applicant – if so, leave the submitter fields blank.

Institution(s)	Georgia Southern University
Applicant Name	Shainaz Landge
Applicant Email	slandge@georgiasouthern.edu
Applicant Phone #	912-478-1883
Applicant Position/Title	Assistant Professor of Chemistry and Biochemistry
Submitter Name	
Submitter Email	
Submitter Phone #	
Submitter Position	

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.

	Name	Email Address
Team Member 1	Shainaz Landge (Project Lead)	slandge@georgiasouthern.edu
Team Member 2	Christine Whitlock (Project Lead)	cwhitlock@georgiasouthern.edu
Team Member 3	Karelle Aiken	kaiken@georgiasouthern.edu
Team Member 4	Abid Shaikh	malnu@georgiasouthern.edu
Team Member 5	Rafael Quirino	rquirino@georgiasouthern.edu
Team Member 6	Hans Schanz	hschanz@georgiasouthern.edu
Team Member 7	John DiCesare	jdicesare@georgiasouthern.edu
Team Member 8	Dawn Cannon-Rech	dcannonrech@georgiasouthern.edu

If you have any more team members to add, please enter their names and email addresses in the text box below.

NA

Please provide the sponsor's name, title, department, and institution. The sponsor is the provider of your Letter of Support.

Dr. Delana A. Gajdosik-Nivens
Dean, College of Science and Mathematics
Professor of Chemistry & Biochemistry
Georgia Southern University

Project Information and Impact Data

Title of Grant Project	Providing low-cost, sustainable learning materials for Organic Chemistry courses
Type of Grant	<i>"No-or-Low-Cost-to-Students Learning Materials,"</i>
Requested Amount of Funding	\$21,400
Course Names and Course Numbers	Organic Chemistry I (CHEM 3401)-Lecture Organic Chemistry II (CHEM 3402)-Lecture
Final Semester of Project	Summer 2020
Average Number of Students Per Course Section Affected by Project	CHEM 3401 and CHEM 3402 = 48 students/section
Average Number of Sections Affected by Project in One Academic Year (Fall and Spring)	CHEM 3401 = 9 sections of 48 students CHEM 3402 = 7 sections of 48 students
Total Number of Students Affected by Project in One Academic Year (Fall and Spring)	CHEM 3401 = 432 CHEM 3402 = 336
Average Number of Students Affected per Summer Semester	96 students (CHEM 3401 and CHEM 3402 sections)
Average Number of Students Affected per Fall Semester	384 students
Average Number of Students Affected per Spring Semester	384 students
Title/Author of Original Required Materials	<i>Organic Chemistry, 3rd ed.</i> Klein (\$170) Online homework (\$30)
Original Total Cost Per Student	\$200
Post-Project Cost Per Student	\$30
Post-Project Savings Per Student	\$170
Projected Total Annual Student Savings Per Academic Year	\$81,600 (Assuming the student purchased the textbook only in Organic Chemistry I and continued for Organic Chemistry II)
Using OpenStax Textbook?	Merlot

Narrative Section

1. Project Goals:

At Georgia Southern University (GSU) the overburdening cost of textbooks affects student life and overall student success. Too often students do not purchase the textbook, because they cannot afford it and thus miss valuable learning opportunities. Without access to a book, students come to class unprepared, are less engaged, and are more prone to failures. Having a low- or no-cost option for students will guarantee that each student has access to the critical learning materials needed for these challenging courses. Giving students around-the-clock, free access to learning materials will alleviate strain and will boost student engagement. Ultimately, the study habits and positive mindset of this culture will lead to improved student learning gains.

As the largest regional university in southeast Georgia and serving more than 20,000 students at the Statesboro campus, any positive change will have a huge impact on the success of the overall student body. Lowering the cost of student expenses will not only benefit our low-income students, but also help each Chemistry, Biochemistry, and Biology majors required to take these courses. With 151 degree programs, the university serves more than 27,000 students on three campuses. Among its many accolades, GSU ranks #2 in affordable colleges in Georgia¹ and #5 nationally for producing African-American graduates in Physical Sciences.² The Department of Chemistry and Biochemistry offers American Chemical Society (ACS) certified degrees in Chemistry and Biochemistry and will soon offer an American Society for Biochemistry and Molecular Biology (ASBMB) certified degree in Biochemistry. With over 400 majors, the department regularly ranks nationally in the top 25 producers of ACS certified BS degrees in Chemistry.

This project proposes to utilize the available, free online open end resources (OER) material and replace the costly textbook for the lecture portion of Organic Chemistry I and II. Our goal is to provide supplementary material (lecture guides, problem sets, slides) tailored to our department needs. Development of the new supplementary material will help to keep class lectures aligned with student learning outcomes (SLO) and everyone involved on track. The materials will include the lecture content, sample problems or worksheets for every chapter in Organic Chemistry I and II according to the ACS accreditation guidelines. Students may view them online or print them before the lectures as they will be shared through the online learning management system (LMS). All developed resources will not only be shared in the department, but also be shared annually on the Galileo OER commons platform.

¹ "2018 Most Affordable Colleges in Georgia." (2018). Retrieved from <https://www.collegeaffordabilityguide.org/schools/georgia/>

² "Top 100 Degree Producers," (2017). Retrieved from <https://diverseeducation.com/top100/>.

Project Goals:

- 1) Adopt the no-cost OER textbook, which will dramatically lower the student expense.
- 2) Align the available online open end resources and the supplementary materials with the course objectives.
- 3) Develop supplementary materials which will provide additional resources tailored to our departmental needs.
- 4) Assess the newly developed materials to measure their effectiveness in student satisfaction, faculty satisfaction, student performance, and student retention.

The primary pedagogical transformation expected with this change is the introduction of a free online textbook and newly-prepared ancillary materials. All faculty members will have the freedom of incorporating the material as they see fit in their courses.

2. Statement of Transformation

Organic Chemistry I (CHEM 3401) and Organic Chemistry II (CHEM 3402) introduce the fundamental concepts of organic chemistry: its structure and bonding of carbon-containing compounds, nomenclature of organic compounds, stereochemistry, spectroscopic techniques and organic mechanisms utilizing various functional groups. It is a two-course sequence that is required for the Chemistry, Biology, and Biochemistry majors, among others. A minimum grade of C is required in CHEM 3401 to progress to the Organic Chemistry II course and subsequent courses.

The lecture and the lab sections of all chemistry courses are linked and primarily taught by the same instructor. This allows the alignment of the content and reinforced lecture content in the laboratory.

Traditionally, students are required to purchase a comprehensive textbook (\$170) combined with online homework system (\$30) for the lecture portion of the course. One textbook is used for both CHEM 3401 and CHEM 3402, but the online homework system must be purchased each semester. A solutions manual to the problems from the textbook is available and is optional. Currently the cost of all required course material is \$200.

We propose to reduce the required cost for course materials from \$200 to \$30 by taking advantage of the free online textbook available on the OER website. To customize the supplementary materials (detailed lecture guides, problem sets, and worksheets) developed by the lead team members and simultaneously edited by the rest of the team members.

The lecture guides, problem sets or work sheets will be supplementary material formatted to help students follow along the fast-paced lectures. They will have a detailed outline of the textbook material used from the OER website in line with the lectures. The structured outline will also be provided for students as well to take notes during the lectures and reading. A similar example can be found at the following [link](#). These editable materials will be shared with all of the

instructors who will be responsible to share or utilize according to their needs on the provided learning management system.

The Statesboro campus of our department includes seven organic chemistry faculty members who work together as a committee to make any decisions regarding changes or new implementation. These organic chemistry faculty members and the COSM library liaison comprise the team for this study.

Student impact: With complete and free availability to the textbook and supplementary material, the students will take advantage of the opportunity and thus be able to achieve higher student learning gains.

Department and College impact: The guarantee that all students have required materials will positively impact the learning culture of our department. Faculty members will encourage more reading and practice problems from the text. The supplementary materials will aid team members in making a smooth transition to online resources in a systematic transformation. All the team members and the leaders in this project are part of the organic chemistry committee in the Statesboro campus of the department and hence will be involved and aware of each part of the implementation process.

University Impact: Inclusive and inexpensive access to the course materials for all of the students taking Organic Chemistry I and II is expected to increase student success, which will be clearly seen at the university level in terms of retention, progression and graduation rates.

3. Transformation Action Plan

Implementation of this project will involve every faculty member teaching organic chemistry at the Statesboro campus. The roles of the team members and efforts are mentioned below.

Project leads (Drs. Shainaz Landge and Christine Whitlock) will be responsible for identifying, aligning, preparing, adapting, and assessing all new course materials for the Organic Chemistry I (Dr. Landge) and Organic Chemistry II (Dr. Whitlock) courses. They will be the lead contacts for the team members and the COSM library liaison and any other organic faculty members and students. They will develop new supplementary materials (lecture guides, problem sets, and worksheets) for the CHEM 3401 and CHEM 3402 courses with the help of team members. They will align the textbook and also develop assessment instruments.

Team Members: Drs. Rafael Quirino and Abid Shaikh will be responsible for reviewing, editing and revising the Organic Chemistry I (CHEM 3401) material created by Dr. Landge. Dr. Quirino will focus on structure, nomenclature and stereochemistry. Dr. Shaikh will focus on early mechanism including substitution, elimination and electrophilic addition reactions.

Team Members: Drs. Karelle Aiken and Hans Schanz will be responsible for reviewing, editing and revising the Organic Chemistry II (CHEM 3402) material created by Dr. Whitlock. Dr. Schanz

will focus on the spectroscopy and aromatic structure and reactions. Dr. Aiken will focus on the carbonyl and amine chemistry including its reaction and mechanistic aspects.

All of the organic chemistry faculty members at the Statesboro campus will aid in developing and implementing the course material and participate in the assessment of this project.

The COSM library liaison (Dawn Rech) will assist in training, identifying and finally distributing the newly created resource material as libguide modules on GSU library website.

Currently, two online Organic Chemistry textbooks are available at no cost. The [first textbook](#) has a biological emphasis and would not be suited for our student's needs. The [second virtual textbook](#) is available on Merlot and would align with our departmental student learning outcomes.

4. Quantitative and Qualitative Measures

All the Organic Chemistry courses taught at the Statesboro campus during the Fall 2019, Spring 2020, and Summer 2020 semesters will participate in this transformation as well as in assessment study. After implementation of the course materials, the assessment study will target the students as well the Organic Chemistry instructors. The team leaders, Dr. Christine Whitlock (Chair and member) and Shainaz Landge (member), are part of the departmental assessment committee as well. They will develop the assessment tools and collect the data focusing on student satisfaction, performance, course level retention, and faculty satisfaction.

Student satisfaction: An available or adapted student satisfaction survey similar to our study using open end resources ([Understanding Students' Satisfaction with OERs as Course Materials](#)) will be utilized to assess student perception of the access, quality, and usefulness of the newly created required course materials.³

The students will be asked to compare the transformation between the previously used hardbound textbook to the available online free material.

Preliminary questions which will be included are:

- 1) Was this a smooth and systematic transformation?
- 2) Was the study material useful in terms of adoption, utilization, access, financial needs etc.?
- 3) What additional required materials will be useful for the future incoming students?
- 4) What needs to be creatively changed in the required, generated materials?
- 5) Do students prefer the free virtual textbook and supplementary materials over a purchased hard copy?

³ Shanna Smith Jaggars, Amanda L. Folk, David Mullins, (2018) "[Understanding students' satisfaction with OERs as course materials](#)", Performance Measurement and Metrics, Vol. 19 Issue: 1, pp.66-74, <https://doi.org/10.1108/PMM-12-2017-0059>)

Faculty satisfaction: The level of overall faculty satisfaction will be measured with a survey similar or adapted to one developed at the University of Wyoming and University of Mississippi.⁴ All faculty members teaching Organic Chemistry will be questioned about student-, instructor-, and institution-related factors. Questions will be adapted to compare the consistency and implementation of the newly-added material with the previous course material.

Student performance: The overall student performance will be measured periodically throughout the semesters with exam grades and the final grades. Midterm assessment will be conducted in all the classes which have implemented the course materials. Organic Chemistry II utilize the ACS standardized exam for the final exam, and the scores from the previous semesters to the semester using OER material will be compared. The DFW percentage grades and withdrawals will be also be compared with previous semesters to check the effectiveness of the change on student performance.

Course-level retention: After implementation and assessment of the materials in Fall 2019, necessary changes will be made and adapted in spring 2020. Spring 2020 will also be used to measure the students' long-term retention both in the courses and in their majors.

Proper attention will be given to the above generated qualitative and quantitative assessment tools to check their reliability, incorporation during the semester, and alignment to the material.

IRB (Institutional Review Board) approval will be sought in the summer of 2019 before implementing the materials in the course and gathering the data from the student. The students will be asked to sign the consent form before collecting any data.

5. Timeline

Late April 2019

- Free, online materials available on the OER websites such as OpenStax, Merlot, virtual textbooks are being reviewed.

May 2019

- Course objectives, learning outcomes, and existing assignments will be reviewed for CHEM 3401 and CHEM 3402. Time will be spent reviewing current course lecture notes. The format of the supplementary materials (lecture guides, worksheets and problem sets) will be established.

⁴ Bolliger, D. U.; Wasilik, O. "Factors influencing faculty satisfaction with online teaching and learning in higher education." *Distance Education*, Vol. 30, No. 1, May 2009, 103–116.; Young, B. "[Assessing faculty perceptions and use of open education resources \(OERs\)](#)." Sustainable community: Association of College and Research Libraries; ACLR-2015, 40-48.

- The online homework system (Sapling Learning or Wiley Plus) will be aligned with our learning objectives.
- Findings will be shared with all the team members.

June 2019

- Supplementary materials will be prepared for both courses by team leads and members.

July 2019

- The guides and links to all course materials will be made available to faculty members through the Folio online learning platform (LMS).

Fall 2019

- New materials will be implemented in all courses (CHEM 3401 and 3402; 8 sections) and evaluated. They will be simultaneously reviewed, edited, and incorporated.

December 2019

- Feedback for online textbook and lecture guides from the students and faculty will be collected and discussed with the involved team members.

Spring/Summer 2020

- All newly-edited materials will be implemented and further assessed.
- The final report will be prepared and shared with the Textbook Transformation Grants committee.

Fall 2020

- Results will be collected and disseminated in STEM Learning and Teaching conferences, as well as a regional Chemistry conference and peer-reviewed publications. The supplementary material will be linked with the libguides as modules on the GSU library webpage and on Galileo open end resources platform.

6. Budget

Dr. Shainaz Landge, \$5000

Dr. Landge will need time during the summer to coordinate team members, develop supplementary materials, align online homework for CHEM 3401, create assessment tools, and disseminate new materials to colleagues.

Dr. Christine Whitlock, \$5000

Dr. Whitlock will need time during the summer to coordinate team members, develop supplementary materials, align online homework for CHEM 3402, create assessment tools, and disseminate new materials to colleagues.

Dr. Rafael Quirino, \$2500

Dr. Quirino will need time during the summer to review, edit, and revise the (1) structure, (2) nomenclature, and (3) stereochemistry subsections of CHEM 3401.

Dr. Abid Shaikh, \$2500

Dr. Shaikh will need time during the summer to review, edit, and revise the (1) substitution, (2) elimination, and (3) electrophilic addition subsections of CHEM 3401.

Dr. Hans Schanz, \$2500

Dr. Schanz will need time during the summer to review, edit, and revise the (1) spectroscopy and (2) aromaticity subsections of CHEM 3402.

Dr. Karelle Aiken, \$2500

Dr. Aiken will need time during the summer to review, edit, and revise the (1) carbonyl and (2) amine subsections of CHEM 3402.

Travel, \$800

Funds will be used for travel to attend USG or STEM or Scholarship of Teaching and Learning conference.

Materials, \$600

Funds will be used for printing and ink supplies for all team members.

7. Sustainability Plan

All Organic Chemistry lecture courses at the Statesboro campus use the same textbook and online homework system. The selection of all these materials is determined by the committee which consist of all the team members who are also part of this proposal. Thus, maintaining the continuity and/or updating of the course material is ensured throughout the Organic Chemistry sequence for years to come. The project leaders will guarantee that the material is up-to-date to current standards and applicable in future semesters. The leads will also be responsible for uploading the new materials on OER Commons along with hosting a library guides (libguides) at GSU library website hence providing sustainable solutions. In the future, we plan to have an entirely online platform for students in Organic Chemistry, which can be easily accessible through libguides to students and the faculty members. After successful implementation of the materials, the data collected will be disseminated on various local, regional and national conferences focused on teaching and learning (USG, STEM, SoTL), and chemical education (American Chemical Society) conferences. The team members also plan to disseminate the results in the peer-

reviewed journals such as Journal of Chemical Education or International Journal of Scholarship of Teaching and Learning (IJSoTL).

Note: Letter of Support



April 5, 2019

Affordable Learning Georgia
Textbook Transformation Grant Review Committee

Dear Review Committee,

I am pleased to provide my highest support for Affordable Learning Georgia Textbook Transformation grant proposal submitted by Dr. Shainaz Landge and Dr. Christine Whitlock of the Department of Chemistry and Biochemistry at Georgia Southern's Statesboro Campus. Their proposal, for open-source lecture materials will reduce the cost of the organic chemistry sequence (CHEM 3401/3402) for 960 students by over \$170 per student. The organic chemistry sequence is used by chemistry, biochemistry, biology, pre-medical and pre-pharmacy students as well as some students in other majors across the university. The materials will be in compliance with all American Chemical Society and Department of Chemistry and Biochemistry learning outcomes for organic chemistry. Through a partnership with the library, the developed materials will be made available on the university common resources OER web-site, making them accessible to organic faculty at other campuses and other universities, further decreasing costs for students.

The grant requests funding to support the creation of the materials, to be completed in the summer of 2019, by a large team of faculty. Once created, the materials will be easy to revise and maintain so that they will be a sustainable resource for the department. The department is experienced with ALG grants—material development, online textbook implementation challenges and the assessment of student learning with online resources— via previous funding provided to general chemistry faculty at the Armstrong campus. Thus, I have confidence that the department has both the experience and the commitment to projects such as this and they will deliver on their stated goals.

The College of Science and Mathematics recognizes the importance of engaging our students in the STEM disciplines and assuring that STEM success is attainable for a diverse student body. Our office will provide additional support as needed for this important work. I am pleased to wholeheartedly support this project.

Thank you for your consideration,

A handwritten signature in black ink, appearing to read "Delana A. Gajdosik-Nivens".

Delana A. Gajdosik-Nivens
Dean
College of Science and Mathematics

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