Affordable Learning Georgia Affordable Materials Grants  
Transformation Grants Final Report

*(or Textbook Transformation Grants, if R17 or earlier)*

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The final report submission form allows you to submit the following:

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* Syllabus or syllabi (required)

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Follow the instructions on the webpage for uploading your documents. Based on receipt of this report, ALG will process the final payment for your grant. ALG will follow up in the future with post-project grantee surveys and may also request your participation in a publication, presentation, or other event.

# General Information

Date: 1/16/25

Grant Round: 24

Grant Number: 679

Institution Name(s): South Georgia State College

Project Lead: Dr. Rauf Tailony

Team Members: Dr. Cindi Kirkland, Mrs. Rebecca Griffin, Dr. Bernard Majdi, Dr. Rauf Tailony

Course Name(s) and Course Numbers: Foundations of Numbers and Operations for Teachers Math 2008, Introduction to Engineering ENGR 2010, Engineering Graphic Design ENGR 2500, Integrated science life and earth sciences ISCI 2001.

Semester Project Began: Spring 2024

Final Semester of Implementation: Summer 2024

Total Number of Students Affected During Project: 150

# Narrative

As part of our commitment to advancing accessible and affordable educational resources, we have successfully developed four open-source textbooks under the ALG grant initiative. These textbooks are:

* Introduction to Engineering: This resource provides foundational knowledge for engineering students, focusing on fundamental concepts, problem-solving techniques, and real-world applications.
* Engineering Design: A comprehensive guide covering design principles, methodologies, and tools such as CAD software, encouraging creativity and innovation in engineering projects.
* Foundations of Numbers and Operations for Teachers: Designed for educators, this book emphasizes mathematical concepts and teaching strategies critical for primary and secondary education.
* Integrated Science: Life and Earth Sciences: This interdisciplinary resource explores key concepts in biology, geology, and environmental science, providing a holistic approach to understanding natural phenomena.

Each textbook was designed with a student-centered approach, ensuring accessibility, inclusivity, and alignment with academic standards. The development process included collaboration with subject matter experts, instructional designers, and editors to ensure high-quality content.

We applied these textbooks across various courses, gathering feedback from students and faculty to refine the content. Early results indicate significant cost savings for students and increased engagement with the material.

We found the project to have a positive impact on student learning based on success rates in each course. Students completed work in a timely manner and never complained of any issues related to the course materials. As instructors, we felt that the work that was submitted was a better indicator of student achievement compared to previous semesters when students had to purchase and use the MyMathLab software program. MyMathLab automatically grades each assignment for each student. We felt as though we were able to see specific topics in which students struggled better with the new material. As the class progressed, we were able to identify class weaknesses and focus on these topics during the semester rather than waiting to the end of the semester to review data analysis on specific learning outcomes. For example, we identified that in both class students seemed to struggle with Venn Diagrams. In response, we continued to post additional videos and exercises relating to Venn Diagrams. By the end of the semester, we could see a great improvement in the Box Quizzes that students were turning in compared to the ones at the beginning of the semester. We feel that designing this free course was beneficial to our students but also helped us become better instructors for our students.

Honestly, the transformation experience was very challenging. We had to design a course that aligned with the student learning outcomes and was appropriately copyrighted. In math, it is hard to design your own images and tables. We wanted to submit quality work that other instructors would find helpful and students would find easy to understand. Due to our own limited capabilities, designing tables and images was limited to our knowledge of Microsoft Word and other common software programs. In the end, we feel as though we have created a successful course that other instructors can build upon. The most important accomplishment noted was that students were very successful using the free resources we designed without having to purchase a textbook. As noted before, this is especially significant in our area where students often come from low-income households. This will have a great impact on our institution in the future as we better serve our students academically and even, financially. Part of our mission at South Georgia State College is to protect the entire well-being of our students.

We learned many things throughout this project. Even though we tried to be careful when designing our lessons, we still found some examples or wording of certain materials to be confusing to students. By piloting the class in Spring 2024, we were able to update our material as we went along to improve the course for Fall 2024 based on student responses. We were also able to create multiple versions of assignments for each semester to try to promote academic honesty since this course was taught online during the project timeline. In the future, we will continue to improve the course assignments based on the needs of our students. Though we created filmed lectures for the course, we decided not to share those as an open resource. We are already redoing some of the video lectures as we feel this is an area that we can improve in the future.

Overall, we found this project to be a positive experience for both us as instructors and our students. We felt a stronger connection with our students because all assignments were hand-graded rather than computer generated. Students received personal feedback from their instructors in a timely manner. We were even able to contact students individually when we saw students struggling. Because of this feedback and personal interaction between students and instructors, both classes had high pass rates. In the future, we plan to continue exploring resources to make our class even better (and still free). As with any class, teachers never stop being students. We will continue to assess our course design and hopefully continue to improve both our materials and pedagogy in the coming academic year.

During this project, we were able to create a complete class including the following: 26 Lesson Notes, 26 Lesson Notes with Answer Keys, 26 Lesson PowerPoints, 26 Lesson PowerPoints with Answer Keys, 15 Box Quizzes, 15 Box Quizzes with Answer Keys, 15 Worksheets, 15 Worksheets with Answer Keys. All of these materials will be available resources for other instructors to use in the University System of Georgia (USG). In addition to these resources, we were able to create 26 videos and exams which we used to complement our course instruction.

# Sustainability Plan

To ensure the long-term success of these open-source textbooks, we have developed a robust sustainability plan. A key component is the implementation of a systematic process for ongoing updates. A dedicated team will periodically revise the content to reflect changes in academic standards, technological advancements, and feedback from users. Faculty integration has been prioritized to encourage widespread adoption and effective use of the materials. Working with library services and IT departments providing technical assistance to maintain the accessibility and functionality of the textbooks.

We will continue to assess and improve the course materials with each academic year. Exploring other OER textbooks to improve our course materials is one of our main goals. Every semester, we plan to create different materials and versions to be used in our classes. We will continue to offer this class with free resources in the future. We will use our assessment results to continue to improve the design of the course to increase academic achievement. Again, Student success and well-being is our primary focus.

# Future Affordable Materials Plans

Building on the success of these textbooks, we plan to expand our efforts to create additional affordable educational materials. One focus will be developing resources for advanced courses in engineering, mathematics, and sciences, catering to upper-level undergraduate and graduate students. To enhance the learning experience, we will integrate multimedia elements, including videos, simulations, and interactive exercises, ensuring that the materials are engaging and accessible to students with diverse learning styles. Collaborations with other institutions and grant agencies will allow us to co-develop resources and share expertise, fostering a broader impact. Furthermore, we plan to translate the textbooks into multiple languages, ensuring accessibility for international students and non-native English speakers. These initiatives will significantly expand the reach and affordability of quality educational resources, promoting equity in education.

We have always paid attention to the price of textbooks for our students. In the past, we have been limited to the number of OER for this particular course. Students did not have the option of purchasing a textbook. They would not be successful if they did not purchase the textbook. In the future, we hope to be able to offer more classes using OER textbooks.

# Future Scholarship Plans

We plan to share our project with other faculty at SGSC in hopes of promoting more partnerships with OER in other disciplines. The development and implementation of these open-source textbooks present significant opportunities for scholarly contributions. Faculty involved in the project are planning to document the impact of open educational resources on student performance, engagement, and cost savings through research publications and conference presentations. To encourage wider faculty participation, we will organize seminars and workshops focusing on OER creation, integration, and best practices. Additionally, students will be invited to contribute to the development and evaluation of these resources, offering them valuable experience in academic publishing and fostering a deeper understanding of course content.