

Affordable Learning Georgia Affordable Materials Grants Continuous Improvement Grants Final Report

General Information

Date: 01/15/2026

Grant Round: 27

Grant Number: M320

Institution Name(s): South Georgia State College

Team Members (Name, Title, Department, Institutions if different, and email address for each):

Team member	Name	Title	Department	Email address
Team member 1	Rauf Tailony	Professor of Engineering	Arts and Sciences	Rauf.tailony@sgsc.edu
Team member 2	Badr Abdallah	Professor of Physics	Arts and Sciences	b.abdallah@sgsc.edu
Team member 3	Lynn Kelly	Lead Librarian	Arts and Sciences	lynn.kelly@sgsc.edu
Team member 4	Ashley Arnold	Librarian	Arts and Sciences	ashley.arnold@sgsc.edu

Project Lead: Rauf Tailony

Course Name(s) and Course Numbers:

ENGR 2500 Engineering Graphics Design, ENGR 2010 Introduction to Engineering

Final Semester of Project:

Fall 2025

Average Number of Students Per Course Section: 30

Number of Course Sections Affected by Implementation of Revised Resources: 4

Total Number of Students Affected by Implementation of Revised Resources: 120

1. Project Narrative

This Continuous Improvement Grant builds on the previous Affordable Learning Georgia project that developed open materials for ENGR 2010 - Introduction to Engineering and ENGR 2500 - Engineering Graphics Design at South Georgia State College.

The new phase strengthens the existing OER courses by adding Excel-based learning modules, SolidWorks design guides, and real-world engineering case studies. The goal is to give students modern, applied skills in design, analysis, and problem-solving while keeping the courses completely free of textbook costs.

Both courses now connect theory to practice more effectively. Students engage in hands-on Excel modeling, design estimation, and visualization exercises, along with SolidWorks-based projects that mirror industry applications and encourage creative problem-solving.

Course	Existing OER	Planned Enhancement
ENGR 2010 Introduction to Engineering	Introduction to Engineering (SGSC), Rauf Tailony, https://alg.manifoldapp.org/projects/introduction-engineering-sgsc	Add Excel Templates and modules, Practice activities, and data-driven engineering problems, Presentation Slides.
ENGR 2500 Engineering Graphics Design	Engineering Graphics Design, Rauf Tailony, https://alg.manifoldapp.org/projects/engineering-design-with-solidworks-2024	Add CAD practice exercises, Maker guides, and design case studies, Presentation Slides.

All revised materials will remain open under a Creative Commons (CC BY) license and will be uploaded to GALILEO and OpenALG for public access.

Project Plan and Progress

The project follows a simple, steady development path from research to refinement.

Phase	Timeframe
Spring 2025	Submit IRB for student data collection, Attend ALG kickoff, Identify suitable OERs, Collect baseline student data (DFW rates, GPA)
Summer 2025	Adapt existing OERs, develop practical engineering exercises, create detailed CAD modeling tutorial guides, and add accessibility and design standards
Fall 2025	Implement enhanced materials in both courses, gather student surveys and performance data, make revisions based on feedback, finalize and publish OERs, submit final report to ALG

Team and Responsibilities

Name	Course Focus	Responsibilities
Rauf Tailony (Lead)	ENGR 2500	IRB approval, content supervision, and reporting
Badr Abdallah	ENGR 2010	Excel module development, integration, and reporting
Lynn Kelly	ENGR 2500	Design guides, case studies, and SolidWorks tutorials
Ashley Arnold	ENGR 2010	MATLAB/Python exercises, feedback collection

The project began with a review of existing OERs and student outcomes from prior semesters. Based on feedback, students wanted more interaction and practical problem-solving experiences.

In response, the team focused on blending design with computation, allowing students to generate models and solve case studies rather than simply read about engineering principles. ENGR 2010 now uses Excel-based mini-projects to explore data concepts, while ENGR 2500 includes new SolidWorks exercises that guide the students towards generating parametric parts and assemblies.

Faculty collaborate using a shared Google Drive workspace, ensuring consistent formatting, accessibility, and integration across both courses. These materials have been actively piloted and refined based on student results and survey feedback.

2. Materials Description

As part of the Affordable Learning Georgia Continuous Improvement Grant (Round 27, 2025–2026), the project team at South Georgia State College enhanced and expanded open instructional materials for two key engineering foundation courses: ENGR 2010 – Introduction to Engineering and ENGR 2500 – Engineering Graphics Design.

1. ENGR 2010 – Introduction to Engineering (Revised and Expanded OER)

Original Work: Introduction to Engineering (SGSC)

<https://alg.manifoldapp.org/projects/introduction-engineering-sgsc>

Enhancements and Additions:

- Integration of Excel-based problem-solving modules covering engineering data analysis, graphing, and system modeling.
- Development of step-by-step tutorials demonstrating engineering calculations, design estimation, and efficiency analysis using Excel tools.
- Inclusion of hands-on micro-projects that apply engineering principles through real-world problem scenarios.
- Addition of self-reading guides, quizzes, and practice exercises for independent study and assessment.
- Updated visual design, file organization, and accessibility features for improved student usability.

2. ENGR 2500 – Engineering Graphics Design (Revised and Expanded OER)

Original Work: Engineering Design with SolidWorks 2024

<https://alg.manifoldapp.org/projects/engineering-design-with-solidworks-2024>

Enhancements and Additions:

- Creation of design guides that walk students through sketching, part modeling, assembly, and rendering in SolidWorks.

- Inclusion of step-by-step tutorials for each design module, featuring example models, diagrams, and design notes.
- Expansion of practice exercises aligned with key mechanical design concepts and industry standards.
- Addition of case studies and example design projects demonstrating practical engineering applications.
- Improved structure, graphics, and accessibility compliance for open distribution and classroom adoption.

Material Links

<https://drive.google.com/drive/folders/1mZi4ttBcuqbM4GoiJkArgEkeUmDjllLP?usp=sharing>

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3. Future Plans

- Develop video-based tutorials accompanying each Excel module and SolidWorks design guide to enhance accessibility and visual learning.
- Add new micro-projects that connect the two courses through a continuous design-and-analysis sequence.
- Expand the repository to include instructor teaching notes, auto-graded assignments, and student design portfolios for wider reuse.
- Evaluate additional opportunities to integrate sustainability and materials recycling projects that align with current research in 3D printing and composite reuse.

The team plans to present project outcomes at upcoming OER and engineering education conferences, including the 2026 ASEE Annual Conference, and to offer internal SGSC workshops on low-cost engineering course design. These efforts will help scale the impact of the project and promote statewide collaboration on OER in STEM. The team also aims to publish a brief case study in the Journal of Open Educational Resources in Higher Education, highlighting the impact of Excel-based and SolidWorks-integrated instruction on student learning outcomes.