Affordable Learning Georgia Affordable Materials Grants
Transformation Grants Final Report

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

Once you have completed this template, to submit your Final Report, go to the [Final Report submission](https://survey.zohopublic.com/zs/xTCCvG) form.

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

* This completed narrative document (required)
* Syllabus or syllabi (required)

*If multiple files, compress into one .zip folder*

* Qualitative/Quantitative Measures data files (optional, as needed)

*If multiple files, compress into one .zip folder*

* Photo of your team or a class of your students for future ALG promotions (optional)
* Invoice for the second half of the grant’s award amount (optional)

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: 5/20/2025**

**RG Grant Number:720**

**Institution Name(s):Kennesaw State University**

**Project Lead: Sumit Chakravarty**

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

**Thomas Murphy, ECE, GSU,** **tmurphy@georgiasouthern.edu**

**Rami Haddad, ECE, GSU,** **rhaddad@georgiasouthern.edu**

**Sylvia Bhattacharya, ECE, GSU,** **sbhatta6@kennesaw.edu**

**Course Name(s) and Course Numbers if applicable:**

**Signal and Systems, EE 3701, ECET 3420, ENGR 2341**

**Semester Project Began: Fall 2024**

**Final Semester: Spring 2025**

# Narrative

* 1. *Describe the key outcomes, whether positive, negative, or interesting, of your project. Include:*
* *Summary of your transformation experience, including challenges and accomplishments*
* *Transformative impacts on your instruction*
* *Transformative impacts on your students and their performance*
	1. *Describe lessons learned, including any things you would do differently next time.*
	2. *Describe any materials you created or revised/remixed that will be shared with the public. Include the* [*open license your materials will be shared under*](https://creativecommons.org/share-your-work/)*—for most materials, this will be an Attribution 4.0 License (CC BY) as required in the Grants Request for Proposals.*

***A. Key Outcomes of the Textbook-Transformation Project***

***1. Summary of the Transformation Experience***

***A free textbook replacement was developed for three Introductory Signals and Systems courses (ENGR 2341, ECET 3420, and EE 3701) at Georgia Southern University (ENGR 2341and Kennesaw State University ECET 3420, and EE 3701). This is replacing the existing textbooks in the courses. Over the academic year our cross-institutional team replaced three high-cost, rapidly aging signals-and-systems texts with an entirely open, modular resource suite. The process unfolded in three phases:***

1. ***Curation & Gap Analysis*** *–* ***mapping every learning outcome in EE 3701, ECET 3420, and ENGR 2341 to existing OER and to the faculty’s proprietary notes;***
2. ***Authoring & Interactive Build-out*** *The textbook replacement consists of ten modules.*

***Module 1 Signals: four sets of notes.***

***Module 2 Continuous-time Systems: two sets of notes and a convolution table.***

***Module 3 Discrete-time Systems: two sets of notes and a convolution table.***

***Module 4 Spectrum: four sets of notes.***

***Module 5 Fourier Transform: four sets of notes and a transform table.***

***Module 6 Sampling: two sets of notes.***

***Module 7 Discrete-time Fourier Transform and Discrete Fourier Transform: three sets of notes and a transform table.***

***Module 8 Laplace Transform: three sets of notes and a transform table.***

***Module 9 z Transform: three sets of notes and a transform table.***

***Module 10 Applications: one set of notes.***

1. ***Iterative Classroom Pilots*** *–* ***three consecutive course offerings at both universities with student-feedback loops and analytics from our LMS plug-in. The notes range typically from three to ten pages. Each module has exercises with problems relevant to each set of module notes and MATLAB scripts for the examples in the notes. Module 10 is still under development and exercise solutions are incomplete. There is also a set of 14 labs that can be used for a signals and systems course with a MATLAB lab component.***

***A Microsoft Word template was developed for all of the written portions to ensure a consistent look, disability accessibility, and meet Affordable Learning Georgia (ALG) copyright requirements. The notes, exercises, and tables were created/updated using this template and the created documents were tested for accessibility. The notes were developed to ensure a length corresponding to a short video (3 to 5 pages corresponding to 5 to 10 minute video). The notes were additionally edited by a student worker for clarity.***

***Challenges.***

***The biggest challenge was ensuring that the materials supported all three courses’ learning objectives with some module material not being used for some courses. Having additional students editing/proofreading the materials and helping to create exercise solutions would have been useful but the team had difficulty hiring student workers with the appropriate background.***

***The Microsoft Word template developed is also being used to format materials for other courses. The knowledge and experience gained from this project is being used to improve other course materials provided to students.***

***Accomplishments.***

**The new materials were used in place of the previous textbook for ENGR 2341 in Spring 2025 and were used as supplemental materials in (add KSU courses). The materials will replace the textbooks in the mentioned courses in Fall 2025. Team members at each university will share the materials and teaching strategies with all faculty teaching the relevant courses. The developed materials for the courses was beneficial for faculty and students. The materials are also more tailored for the courses, students had significant savings from a costly book, and permanent access to the materials if they had rented an eBook.**

***C. Publicly Shared Materials & Licensing***

| ***Material Type*** | ***Quantity*** | ***Format*** | ***Repository*** | ***License*** |
| --- | --- | --- | --- | --- |
| *Core Text Chapters* | *10* | *PDF, HTML* | *ALG GALILEO Open Learning Materials* | ***CC BY 4.0*** |
| *MATLAB Live Scripts & Simulink Models* | *40* | *.mlx / .slx* | *MathWorks File Exchange, GitHub* | ***CC BY 4.0*** |
| *Micro-lecture Videos* | *10* | *MP4 w/ captions* | *Kaltura Commons, YouTube EDU* | ***CC BY 4.0*** |
|  |  |  |  |  |
| *Instructor Guides & Slides* | *>3 per chapter* | *PPTX / PDF* | *ALG Repository* | ***CC BY 4.0*** |

# Quotes

*Provide three quotes from students evaluating their experience with the no-cost learning materials.*

***“ The notes help clarify my understanding”***

***“ It was helpful as a review”***

# Quantitative and Qualitative Measures

## Uniform Measurements Questions

*The following are uniform questions asked to all grant teams. Please answer these to the best of your knowledge.*

**Student Opinion of Materials**

**Was the overall student opinion about the materials used in the course positive, neutral, or negative?**

Total number of students affected in this project: \_\_\_\_\_\_\_\_\_\_

* Positive: \_\_\_\_\_\_\_ % of \_\_\_\_\_\_\_\_ number of respondents
* Neutral: \_\_\_\_\_\_\_ % of \_\_\_\_\_\_\_\_ number of respondents
* Negative: \_\_\_\_\_\_\_ % of \_\_\_\_\_\_\_\_ number of respondents
* **Students affected by the project so far:79**
* **I did not give a survey (forgot with end of semester crunch).**
* **Anecdotally positive. From the course evaluations, there were no complaints on having the materials versus a commercial textbook.**

**Student Learning Outcomes and Grades**

**Was the overall comparative impact on student performance in terms of learning outcomes and grades in the semester(s) of implementation over previous semesters positive, neutral, or negative?**

*Student outcomes should be described in detail in Section 3b.*

Choose One:

* \_\_\_ Positive: Higher performance outcomes measured over previous semester(s)
* \_\_\_ Neutral: Same performance outcomes over previous semester(s)
* \_\_\_ Negative: Lower performance outcomes over previous semester(s)
* **Positive.**
* **Grades were comparable or better. Weekly assessment and lab performance were better with the more tailored material**

**Student Drop/Fail/Withdraw (DFW) Rates**

**Was the overall comparative impact on Drop/Fail/Withdraw (DFW) rates in the semester(s) of implementation over previous semesters positive, neutral, or negative?**

*Depending on what you and your institution can measure, this may also be known as a drop/failure rate or a withdraw/failure rate.*

\_\_\_\_\_\_\_% of students, out of a total \_\_\_\_\_\_\_ students affected, dropped/failed/withdrew from the course in the final semester of implementation.

Choose One:

* \_\_\_ Positive: This is a lower percentage of students with D/F/W than previous semester(s)
* \_\_\_ Neutral: This is the same percentage of students with D/F/W than previous semester(s)
* \_\_\_ Negative: This is a higher percentage of students with D/F/W than previous semester(s)
* **Grades from Spring 2024 (used commercial textbook)**
* **Total 26**
* **D – 5**
* **F - 5**
* **W – 2**
* **Three of the Fs turned in almost no work**
* **DWF 34.6%**
* **Grades from Fall 2024 (used materials with commercial textbook optional)**
* **Fall 2024**
* **Total 16**
* **D - 1**
* **W – 4**
* **DWF 31.25%**
* **Grades from Spring 2024 (used materials with commercial textbook optional)**
* **Spring 2025**
* **Total 37**
* **D - 2**
* **F - 0**
* **W - 2**
* **DWF 14.8%**
* **There were more repeats than usual so I would be hesitant to say this is entirely attributable to the new materials.**

## Measures Narrative

*In this section, summarize the supporting impact data that you are submitting, including all quantitative and qualitative measures of impact on student success and experience. Include all measures as described in your proposal, along with any measures developed after the proposal submission.*

*[When submitting your final report, as noted above, you will also need to provide the separate file (or .zip with multiple files) of supporting data on the impact of your Textbook Transformation, such as surveys, analyzed data collected, etc.]*

* *Include measures such as:*
	+ *Drop, fail, withdraw (DFW) delta rates*
	+ *Course retention and completion rates*
	+ *Average GPA*
	+ *Pre-and post-transformation DFW comparison*
	+ *Student success in learning objectives*
	+ *Surveys, interviews, and other qualitative measures*
* *Indicate any co-factors that might have influenced the outcomes.*
* ***With materials replacing textbook in Spring 2025, usage was generally good. From Folio tracking***
* ***9/35 used > 75% of materials***
* ***14/35 used 50 – 75% of materials***
* ***12/35 used < 50% of materials***
* ***There were no complaints from students about lack of a textbook from either Fall 2024 or Spring 2025 outside of the ALG materials. One student comment from course evals suggested more example problems.***
* ***The only student complaints from Spring 2025 was the delivery method, fully online versus face-to-face. The Spring 2025 section at GSU was fully online (asynchronous) and some students did not like the delivery method. Tough to tell from the course evals whether students did not like the delivery method versus did not think the course materials were appropriate.***

# Sustainability Plan

*Describe how your project team or department will offer the materials in the course(s) in the future, including the maintenance and updating of course materials.*

***The course will be used in a regular manner at both the universities.***

# Future Affordable Materials Plans

*Describe any impacts or influences this project has had on your thinking about or selection of learning materials in this and other courses that you will teach in the future.*

**n/a**

# Future Scholarship Plans

*Describe any planned or actual papers, presentations, publications, or other professional activities that you expect to produce that reflect your work on this project.*

***Conference ASEE southeast, Nationals***

# Description of Photograph (optional)

*This is where a team can list the names of the people shown in this separately uploaded photograph, along with their roles, if applicable.*