Affordable Materials Grants, Round 19:

Transformation Grants

(Spring 2021-Spring 2022)

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.
* The only way to submit the official proposal is through the online Google Form. The link to the online application is on the [Round 19 RFP Page](https://www.affordablelearninggeorgia.org/about/rfp_r19).
* The italic text provided below is meant for clarifications and can be deleted.

The Round 19 Kickoff will include an asynchronous training module, required for all team members to complete, followed by the synchronous Kickoff Meeting on March 26, 2021 from 1pm-4pm. At least two team members from each awarded team (unless the award is for one individual) are required to attend the synchronous Kickoff Meeting.

# Applicant and Team Information

| Requested information | Answer |
| --- | --- |
| Institution(s) | Georgia State University |
| Applicant name | Shelby Frost |
| Applicant email  | sfrost@gsu.edu |
| Applicant position/title | Clinical Associate Professor |
| Submitter name  | Cynthia Searcy |
| Submitter email  | csearcy@gsu.edu |
| Submitter position/title | Associate Dean for Academic Innovation & Strategy |

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.

| Team member | Name | Email address |
| --- | --- | --- |
| Team member 1 | Shelby Frost | sfrost@gsu.edu |
| Team member 2 | Todd Swarthout | swarthout@gsu.edu |
| Team member 3 | Mya Eveland | meveland@gsu.edu |
| Team member 4 | Graduate Assistant#1 | TBD |

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

|  |
| --- |
| Team member 5: Graduate Assistant#2 name/email TBDTeam member 5: Graduate Assistant#3 name/email TBD |

# Project Information

| Requested information | Answer |
| --- | --- |
| Priority Category / Categories | Priority categories: * Collaborative Projects with Professional Support
* Student Participation in Materials Evaluation and/or Development
 |
| Requested Total Amount of Funding | $29,000 |
| Final Semester of Project | Spring 2022 |
| Using OpenStax Textbook? | Yes. We will curate OER from OpenStax and elsewhere for learning content that aligns with the course goal and learning objectives. |

# Impact Data

Please fill in the table below with impact data from one course (all sections), and only include courses and instructors that are specifically part of the scope of this grant proposal. Add or remove tables as needed. **Please only put a single averaged or totaled (as appropriate) number in each box. Do not put ranges or mathematical equations in any of these boxes.** If the materials used by different instructors in a course vary drastically, it is possible to enter one course per instructor.

For a multi-course project, if a significant amount of students are assumed to take courses in a sequence and only one textbook is used for these courses, please take this into account in your total *(i.e. only include that book in the first course they would purchase it for OR adjust the number of students affected. Please explain in the notes section if making such adjustments).*

## Course 1

| Row # | Requested information | Answer |
| --- | --- | --- |
| N/A | Course title and number | ECON 2106 Principles of Microeconomics |
| N/A | Course instructors | All sections; Shelby Frost is the lead faculty member |
| 1 | Average number of students enrolled per section | 65 |
| 2 | Average number of affected course sections scheduled in a summer semester | 6 |
| 3 | Average number of affected course sections scheduled in a fall semester | 22 |
| 4 | Average number of affected course sections scheduled in a spring semester | 12 |
| 5 | Total number of course sections scheduled in an academic year  | 40 |
| 6 | Total number of student section enrollments per academic year*Multiply row 1 and row 5.* | 2,600 |
| 7 | Original required commercial materials*Include each title, author, price for a new copy purchased from either your campus bookstore, the publisher, or Amazon, and a URL to the book showing the price.* | *Principles of Economics* (2nd ed) by Carlos Asarta and Roger Butters (2016)Publisher: McGraw-Hill Higher EducationFormats: Adobe Ebook Reader and Connect Master |
| 8 | Original cost per student section enrollment | $75.00 (6 month access) |
| 9 | Average post-project cost per student section enrollment | $0 |
| 10 | Average post-project savings per student section enrollment | $75.00 |
| 11 | Projected total annual student savings per academic year | $195,000 |

# Narrative Section

## 1. Project Goals

This proposal aims to transform all sections of Principles of Microeconomics (ECON 2106) to no-cost learning materials. The course is required for undergraduate ECON majors (BA/BS) and is an elective course in Area E of the core curriculum. Many social science and business majors require it in Area F. All sections of the course at the downtown campus use the same textbook and course template in D2L/Brightspace.

Goal 1 is to eliminate the cost of learning materials for the course, and thereby reduce students’ financial burdens. As currently taught, the textbook costs $75 for six months of access to an ebook and adaptive learning platform (Connect). This is a substantial sum for any student, but especially ours: almost 60% qualify for Pell grants. By replacing that textbook with no-cost materials, the proposed transformation will save GSU students close to $200,000 per academic year.

Goal 2 is to increase students’ timely access to course materials and thereby improve student success. Due to the cost of textbooks generally, many students forgo purchasing them, or wait too long to do so. This impedes their ability to complete assignments, score well on quizzes/tests, succeed in the course, and, more generally, succeed in higher education (which, of course, affects their post-education life). With access to all learning materials from day one of the course, we expect the proportion of students who earn Ds, Fs, or Ws to decrease.

Goal 3 is to create a set of manipulatives and games that allow students to engage with graphs and experiments to enhance student learning of difficult economics concepts. Currently the department relies on applications in the McGraw-Hill Connect platform to generate, visualize and manipulate graphs of key concepts. This proposal aims to use the coding expertise of a research scientist in our Experimental Economics Center (ExCEN) to build manipulatives for this course so that students have high-quality, technology-enabled learning materials without the cost of a textbook. In addition, the team will supplement the manipulatives with games that allow students (individually or in groups) to discover the concept of equilibrium in markets (supply and demand), the tragedy of the commons with common pool resources and free-riding on voluntary provision of public goods (classic problem solving in economics and political science), and auctions (useful for understanding aspects of environmental policy, human behavior, and finance). Once the games and manipulatives are built, they will be hosted on a website that USG institutions and others can use for principles courses in economics. In addition, we also hope to develop SCORM packages of these manipulatives that can be downloaded from a website for integration with common LMS systems.

## 2. Statement of Transformation

ECON 2106 is a service course in the core curriculum that enrolls approximately 2,600 students at the GSU downtown campus each academic year. Most students take the course as freshman and sophomores when they’re exploring majors or attempting it as a pre-requisite to enter majors. Among lower-level courses in the university, ECON 2106 has a higher than average DFW rate (~20%). Although this DFW rate is not unique to GSU, it is one that the department has worked to lower over the years because it impedes student progress in their degrees. As a result of moving all instruction online in response to COVID, the department adopted a master course model that uses the McGraw-Hill textbook and its adaptive learning platform, Connect. While this move to standardize the course removed variation in course quality by adopting a version designed by Shelby Frost (course lead) that had previously been vetted for high quality online delivery, students still must pay for the McGraw-Hill text and platform.

Since 2019, the Andrew Young School of Policies Studies has been adopting low-cost/no-cost texts for its courses through its AYS Open initiative. Because ECON 2106 is a large service course, it has been high on the list to convert to OER, but loss of the interactive and adaptive learning content provided by publishers worried faculty that student learning would suffer. When transitioning to open textbooks, access to this software is either eliminated or available via à la carte purchase, with either scenario reducing the value proposition of open source textbooks.

This proposal aims to design a replacement for this publisher-provided active-learning software so that moving to a no cost textbook does not impede student learning. We also are motivated by our experience over decades of teaching experiments that many economics concepts can be demonstrated more effectively with interactive games rather than static learning materials. We aim to combine existing OER learning materials available for principles in microeconomics with manipulatives and games to provide thousands of students each year a no cost path to fulfilling a core requirement.

## 3. Action Plan

We seek funding to develop manipulatives and games and integrate at least five of them in ECON 2106 by Fall 2021 to supplement the curated OER (textbooks or otherwise) that will replace the current McGraw-Hill textbook and Connect platform. The project team consists of two subject matter experts, an instructional designer, and a graduate assistant. Shelby Frost (Clinical Associate Professor) and Todd Swarthout (Assistant Research Faculty) are economics faculty, and Mya Eveland is our college’s instructional designer. These three will be assisted by a graduate student to help with coding the manipulatives, review the course from a student’s perspective, and gather/analyze all data for course assessment (See next section for evaluation plan). We expect the two faculty to spend a minimum of 120 hours each over summer 2021 to identify/develop OER content and write assessments (Shelby Frost) and develop the manipulatives/games (Todd Swarthout).[[1]](#footnote-2) Our instructional designer will manage the project, ensure that the learning framework is pedagogically sound, and create/arrange all content in D2L/Brightspace to meet accessibility standards (200 hours). The graduate student will help with coding the manipulatives/games, review sections of the course as they are built to evaluate the quality of the student experience and course design, and collect/analyze data for course assessment during Fall 2021 and Spring 2022 (320 hours).

Our process for transforming ECON 2106 includes:

Step 1 is to develop a course framework that identifies the course goal, learning objectives, content, products, and assessments. While the course goal and learning objectives largely are established by the department, the bulk of the work at this stage is to determine what OER learning materials need to be curated and what manipulatives need to be built to support effective learning. This process will include examining past assessments to identify concepts that students fail to demonstrate proficiency, as well as review current McGraw-Hill analytics to see which textbook manipulatives students are engaging with the most. Once we have a good understanding of learning gaps and features of current resources that students use, we will have a framework for identifying OER and building manipulatives/games.

Step 2 is curating OER materials for each learning objective and course topic. Texts may be articles, chapters, textbooks, or another type of publication (e.g., government reports, newspaper articles).[[2]](#footnote-3) To select between texts, we will take into account ALG’s evaluation criteria: clarity, comprehensibility, readability, content accuracy and technical accuracy, adaptability, appropriateness, and accessibility. We will only consider texts that are open access (i.e., free to everyone) or available as unlimited e-versions via the GSU library (e.g., articles available via Galileo). In addition to texts, we will seek out digital educational content, including websites, audio files, videos, and more. With the support of our instructional designer and multimedia team in the Center for Excellence in Teaching, Learning, and Online Education (CETLOE), we will also produce original content in the forms of audio recordings, video productions, PowerPoints, and other materials as learning content as needed.

Step 3 is building the manipulatives and games to supplement the OER content for economics concepts that students struggle to learn via text, illustration, or video alone. [Some manipulatives exist in the public domain](https://demonstrations.wolfram.com/topic.html?topic=Microeconomics&limit=20) already, but these: 1) do not integrate easily into an LMS to use in assessments; and, 2) cannot be modified to adjust the inputs or designs to the graphs without using their platforms. Similarly, [experimental games have already been developed by ExCEN](https://econport.org/econport/request?page=web_experiments), but the software is outdated and does not integrate with D2L/Brightspace. To be able to build these manipulatives and games in an OER environment and with the functionality to integrate with an LMS for assessment, will replace the value that textbook publishers offer to the course with their interactive platforms.

Step 4 is to build a “master” course in our LMS (D2L/Brightspace) to use across all sections of ECON 2106. Our instructional designer will organize and build the course using best practices for online, asynchronous delivery but create a facilitation guide that modifies how the learning activities and assessments are deployed if the course is taught as hybrid or face-to-face (classroom). As sections of the course are completed, the graduate assistant will review them for learning quality and evaluate assessment alignment with course objectives and learning content. Lastly, a member of the undergraduate curriculum committee in the department will use a modified Quality Matters rubric to assess the course for quality online delivery.

With those steps complete, we will make our no-cost content publicly available in the form that makes it most accessible and sustainable. We aim to consult the ALG team before starting the project for guidance on the requirements to create GALILEO Open Learning Materials and license them through Creative Commons. Whatever the best platform, we anticipate also making the course available as a D2L or Canvas package upon request.

## 4. Quantitative and Qualitative Measures

The transformations’ success will be assessed by obtaining and analyzing data of (1) student satisfaction, (2) student performance, and (3) course-level retention.

Student satisfaction will be measured with two surveys. Both surveys include quantitative and qualitative components. The first student satisfaction survey is administered in all sections of the course at mid-term to evaluate the student’s learning experience with course materials, learning activities, assessments, and instructor facilitation. Results from the mid-term evaluation permits the design team to make adjustments to the course/facilitation if needed during the semester. (See Appendix A for survey). It is deployed in the course for a week and results are reviewed by our instructional designer with the instructor to adjust pacing, learning content, facilitation, etc.

The second student satisfaction assessment is the end of course evaluation administered by GSU. For Fall and Spring terms, the evaluation period is available two weeks before classes end until five days after grades become available. For Summer terms, the evaluation period is available one week before classes end until five days after grades become available. GSU’s student evaluation of instructor (SEI) instrument includes quantitative and qualitative components that provide feedback on the quality of the course and the instructor. (See Appendix B.) Results from each section’s SEI will be reviewed at the end of each semester to compare results across sections and make adjustments to the course and/or its facilitation where necessary.

Student performance will be determined in two ways. One is through student grades, including not only final grades but also those on specific assessments measuring formative learning at different points in the semester (e.g., quizzes, discussion posts, mid-term exams). The second way we will assess student performance is through a pre- and post-test that will not count toward student grades but will measure their learning via the [Test of Understanding College Economics (TUCE)](https://www.econedlink.org/wp-content/uploads/2018/09/TUCE-4th.pdf). These questions are developed by the National Center for Research in Economics Education and assess the essential knowledge of economics principles. The TUCE is nationally normed and will be a useful tool to measure student learning outcomes.

Finally, course-level retention will be determined with [IPORT](https://dssapex.gsu.edu/pls/apex/f?p=114:1::::::), which is GSU’s “web-based application that provides access to data stored in the University Data Warehouse.” For each GSU course section, IPORT has a daily record of how many students dropped it (or added it); the number of students who failed (D or F); and, the number of students who withdrew. These are just a few of the variables available via IPORT. We will use others, as appropriate, to better understand the range of factors that shape the effect of textbook costs on DWF rates, in addition to measures of student performance (e.g., mean, median, and mode of final grades).

We expect to compare all of these measures to sections of ECON 2106 offered prior to the course transformation (excluding COVID-impacted semesters). In addition, before fully deploying the course across all sections of ECON 216, we would like to pilot it in Fall 2021 in multiple sections to compare it to online sections that continue to use the McGraw-Hill text. If approved by IRB, we anticipate randomizing students into online sections with assignment to the OER version versus the McGraw-Hill text to compare students on the measures described above. This random assignment should help answer questions about the impact of immediate, free access to course materials on early formative assessments in the course and assess differences in the effectiveness of the courses themselves.

## 5. Timeline

March 26, 2021: Kickoff Meeting

April 2021: Assess student performance in current course and platform to identify learning gaps and usage of Connect manipulatives; Develop course framework; Curate existing OER learning materials that align with course goal and learning objectives.

May-July 2021: Select OER and develop videos/supplementary learning content for course build; Design assessments; Develop manipulatives and games; Build course in D2L/Brightspace; Assess sections as completed (graduate assistant) and fully built (undergraduate committee review).

August-December 2021: Pilot course in multiple sections taught by Shelby Frost (online and in-classroom); Review mid-term survey for course adjustments; Review SEI and other end of course measures to compare to sections taught with McGraw-Hill in fall 2019 and spring 2021.

January 2022: Make adjustments to OER course. Write and submit ALG Fall 2021 semester status report.

January-May 2022: Launch phase II of OER course and compare to McGraw-Hill version through random assignment of students enrolled in online sections; Analyze performance data across sections; Write and submit ALG final report

June 2022 and after; Refine course for future semesters; develop facilitation guide for teaching across all sections regardless of modality; Apply for Creative Commons license and move materials to USG’s OER sharing platform.

## 6. Budget

The requested budget is $29,000. This total breaks down as follows:

Summer 2021:

1. Shelby Frost (faculty) $5,000

2. Todd Swarthout (faculty) $5,000

Spring 2021-2022:

1. Instructional Design $5,000

2. Project Management $2,000

Project Assistance & Assessment (Summer 2021-Spring 2022)

1. Graduate Assistant $4,000

2. Graduate Assistant $4,000

3. Graduate Assistant $4,000

## 7. Sustainability Plan

As outlined in the Statement of Transformation section, the proposed project will affect up to 2,600 students each year when fully implemented across all sections at the downtown campus by Summer 2022. When the project is complete, we plan to share the course with Perimeter College faculty to offer their sections as no-cost.

Post-transformation, the course will be updated as new manipulatives and games are developed and new OER content is identified. Because multiple instructors will adopt the same version of the course, they can – and will – act on ways to improve it, semester by semester. However, the lead faculty member (Shelby Frost) is charged with overseeing that the course is taught similarly across all sections and will approve deviations from the course design. Significant changes to the course may occur when the course is “refreshed” every three years.

Moreover, this project will provide useful insight, and serve as a good example, for transforming ECON 2105 Principles of Macroeconomics to no-cost. Currently this course enrolls the same number of students each academic year (~2600) and uses the McGraw-Hill textbook and adaptive learning platform. Savings for the future transformation of ECON 2105 are expected to be equal to this course.

Lastly, the design team for this course hopes to publish findings from the research and assessment of converting principles in microeconomics to no-cost in pedagogical and discipline specific teaching materials. These publications can support research on OER, specifically in regard to active learning methods using manipulatives and games.

# Creative Commons Terms

*I understand that any new materials or revisions created with ALG 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 the use 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.*

|  |
| --- |
| *Sally Wallace, Dean and Professor of Economics* |

# 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.*

|  |
| --- |
| *Caroline Griffin, Business Manager III, Department of Economics**Joseph J. McLeod, MHA, Managing Institutional Officer, Office of Sponsored Proposals & Awards, GSU Research Services & Administration\***\*Mr. McLeod’s letter of acknowledgement will be submitted after the proposal is vetted through OPSA.* |

1. Faculty will teach and be involved with the assessment of the course during Fall 2021 and Spring 2022, but these hours will be performed under their teaching and service responsibilities. [↑](#footnote-ref-2)
2. Many OER sites have principles of economics textbooks that can be used for this course (e.g., [OpenStax](https://openstax.org/details/books/principles-microeconomics-2e), [Lumen OER](https://lumenlearning.com/courses/microeconomics/), [Saylor Academy](https://learn.saylor.org/course/view.php?id=8), etc.) These sources and others will be reviewed and adopted as they align with course learning objectives. [↑](#footnote-ref-3)