

Application Details

Manage Application: ALG Textbook Transformation Grant

Award Cycle: Round 4

Internal Submission Deadline: Monday, September 7, 2015

Application Title: 175

Submitter First Name: Barbara

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Applicant First Name: Edwynn

Applicant Last Name: Wallace

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Applicant Phone Number: 478.934.3146

Primary Appointment Title: Associate Professor of Physics

Institution Name(s): Middle Georgia State University

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

Edwynn Wallace, Associate Professor of Physics, edwynn.wallace@mga.edu

Malav Shah, Associate Professor of Physics, malav.shah@mga.edu

Sponsor, (Name, Title, Department, Institution):

Martha Venn, PhD, Provost, Academic Affairs, Middle Georgia State University

Proposal Title: 175

Course Names, Course Numbers and Semesters Offered:

Introductory Physics I: PHYS 1111K. Offered Fall 2015, Spring 2016, Summer 2016, Fall 2016, Spring 2017

Introductory Physics II: PHYS 1112K. Offered Spring 2016, Summer 2016, Spring 2017

Final Semester of Instruction:	Spring 2017
Average Number of Students per Course Section:	24
Number of Course Sections Affected by Implementation in Academic Year:	9
Total Number of Students Affected by Implementation in Academic Year:	216
List the original course materials for students (including title, whether optional or required, & cost for each item):	Physics: Principles with Applications with e-text and MasteringPhysics Access Code, Giancoli, 7 th ed., Required, \$289.60 Physics Laboratory Experiments, Wilson, 7th ed., Required, \$218.95
Proposal Categories:	OpenStax Textbooks
Requested Amount of Funding:	\$10,800
Original per Student Cost:	\$508.55
Post-Proposal Projected Student Cost:	\$23.00
Projected Per Student Savings:	\$485.55
Plan for Hosting Materials:	D2L

Project Goals:

- Significantly lower the cost of student materials in the PHYS 1111/1112K Introductory Physics I and II sequence.
- Improve student course retention.
- Improve or maintain student learning in the sequence.
- Improve or maintain student course satisfaction.

Statement of Transformation:

As an open access institution, Middle Georgia State University serves a diverse population of students. Many of these students are from backgrounds that are underrepresented in STEM fields and have limited financial flexibility.

This transformation will decrease the costs to these students through adopting the free online textbook from OpenStax College, College Physics by Urone and Hinrichs, for the Introductory

Physics (trigonometry-based) sequence. Along with changing the textbook, a lower cost online homework system, WebAssign, will be adopted to replace the current system. Another cost reduction is to replace the laboratory text with no-cost-to-student laboratory exercises. These actions would reduce the cost per student by \$486.

The most important stakeholders in this transformation are the students that take the Introductory Physics sequence. The course rosters are mostly comprised of Biology majors working toward careers in the STEM fields, medicine, pharmacy, or allied health occupations. With the addition of students taking these courses as electives, this project would lower the cost to approximately 200 students per academic year.

Physics is a constructive subject where the foundations are laid in the first few weeks. These foundational principles are built upon continuously throughout the two course sequence. Student who do not buy or cannot afford the course materials at the beginning of the semester find themselves at a distinct disadvantage. Many of them withdraw or fail the course. Free and low cost materials would remove this barrier and permit these students to move forward with their education. This transformation should increase student success in the course and improve graduation and retention rates for the University while significantly lowering the costs of education to students.

Transformation Action Plan:

- The OpenStax text, College Physics, will need to be reviewed to verify that it meets course and instructor learning outcomes. Supplementary material may need to be added or developed if some outcomes are not met.
- Course syllabi including content schedule will be adapted to accommodate the new textbook.
- Lecture presentations, test questions, and assignments will be adjusted to use College Physics.
- Homework assignments will be redesigned using the WebAssign homework system.
- Using existing equipment, no-cost-to-student laboratory exercises will be implemented to replace the expensive laboratory text.
- A student opinion survey of the textbook will be developed and distributed to students taking the course.
- Student course retention, student learning, and student course satisfaction will be assessed and compared to earlier data.

Both Edwynn Wallace and Malav Shah will work as subject matter experts and instructional designers. They will collaborate in the redesign of the physics sequence as well as implement the changes in their respective classes. Both team members will attend the kick-off training meeting in October and complete status and final project reports.

Links to the OpenStax textbook, online homework system, and laboratory printouts will be available to students via Brightspace/D2L.

Any developed material will be made available to the public via individual team member

University hosted websites.

Quantitative & Qualitative Measures: Drop, withdraw, and fail (DFW) rates will be collected from previous semesters and compared to DWF rates after implementation.

The Force Concept Inventory and the Conceptual Survey in Electricity and Magnetism will be administered to students as a pre/post test to measure student learning. The normalized gain will be compared to previous semesters.

Student Evaluation of Faculty questionnaire quantitative results will be compared to previous results for each instructor to measure student course satisfaction.

Qualitative results from student comments on the evaluations will also be examined.

A student opinion survey of the textbook will be developed and administered to measure student response to the OpenStax textbook.

Timeline:

Fall Semester 2015:

- Review the OpenStax text and identify topics that may need supplementary material.
- Evaluate current syllabi and decide what changes need to be made.
- Begin adjustments of lecture presentations, test questions, and assignments.
- Begin to create homework assignments in Web Assign.
- Identify gaps in laboratories not covered by current no cost to student material and begin to investigate or design replacement exercises.

Spring Semester 2016:

- Finalize all changes to the course sequence including syllabi, course materials, homework assignments, and laboratories.
- Develop the student opinion survey of the textbook.

Summer Semester 2016:

- Offer courses over the summer to test modifications and make adjustments.

Fall 2016 and Spring 2017 Semesters:

- Fully implement course sequence transformation.

Budget:

\$5000 Overload Pay for Edwynn Wallace, Subject Matter Expert and Instructional Designer

\$5000 Overload Pay for Malav Shah, Subject Matter Expert and Instructional Designer

\$800 for Miscellaneous Expenses and Travel

Total Expenditures: \$10,800

Sustainability Plan:

There are no additional costs to maintain the transformation of the Introductory Physics sequence. The OpenStax textbook and Web Assign should continue to be available for many years. Additional materials will be housed on D2L which is maintained by the University System. The no-cost-to-student laboratory exercises will be adjusted as equipment and needs change. Any supplementary material developed during the transformation will be made available to the public via individual team member University hosted websites.



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Macon
Cochran
Dublin
Eastman
Warner Robins
and online everywhere

September 3, 2015

To Whom It May Concern:

From: Dr. Marti Venn, Provost

Middle Georgia State University

RE: Letter of Support for Affordable Learning Georgia Award 2015-2016

I am pleased to provide this letter of support for Dr. Edwynn Wallace and Mr. Malav Shah's proposal from the Department of Natural Sciences to transform the introductory sequence in Physics I (PHYS 1111K) and Physics II (PHYS 1112K). The first course is taught all three semesters (Fall, Spring and Summer) and the second sequence course is taught two semesters (Spring and Summer). Over 70% of Middle Georgia State College students are on financial aid and could not afford to come to college without that support. Currently students pay \$486.00 for the sequence of course in textbook and laboratory experiments. If this project is funded the costs for students will only be \$23.00! This is a significant savings to our students. This RFP dovetails well with our University core values of "stewardship" and "adaptability" and to serve our students in new and transformative ways while reducing student debt. My office is committed to sustainability of this project after this year. Through our Center for Teaching Innovation we can provide faculty professional development to transform these courses. If funded, my office stands ready to support, champion, and publically recognize the work of the School of Education and USG Affordable Learning Georgia Funding!