

## Application Details

---

### Manage Application: ALG Textbook Transformation Grant

---

**Award Cycle:** Round 4

**Internal Submission Deadline:** Monday, September 7, 2015

---

**Application Title:** 181

**Submitter First Name:** Dereth

**Submitter Last Name:** Drake

**Submitter Title:** Assistant Professor of Physics

**Submitter Email Address:** djdrake@valdosta.edu

**Submitter Phone Number:** 229-249-4852

**Submitter Campus Role:** Proposal Investigator (Primary or additional)

**Applicant First Name:** Dereth

**Applicant Last Name:** Drake

**Applicant Email Address:** djdrake@valdosta.edu

**Applicant Phone Number:** 229-249-4852

**Primary Appointment Title:** Assistant Professor of Physics

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

---

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

Dereth J. Drake, Assistant Professor of Physics, Department of Physics, Astronomy, and Geosciences, djdrake@valdosta.edu

Shantanu Chakraborty, Physics Instructor, Department of Physics, Astronomy, and Geosciences, shchakraborty@valdosta.edu

Michael Holt, Assistant Professor and Reference Librarian, Odum Library, moholt@valdosta.edu

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

Dr. Edward Chatelain, Chair, Department of Physics, Astronomy, and Geosciences, Valdosta State University

**Proposal Title:** 181

**Course Names, Course Numbers and Semesters Offered:**

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

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

<b>Final Semester of Instruction:</b>	Spring 2017
<b>Average Number of Students per Course Section:</b>	25
<b>Number of Course Sections Affected by Implementation in Academic Year:</b>	12
<b>Total Number of Students Affected by Implementation in Academic Year:</b>	300
<b>List the original course materials for students (including title, whether optional or required, &amp; cost for each item):</b>	Physics by John D. Cutnell & Kenneth W. Johnson, 10 <sup>th</sup> Ed. (required); cost: \$214 Laboratory Manual for 1111K or 1112K (required); cost: \$10 each Schaum's Outline for College Physics, 11 <sup>th</sup> Ed. (optional); cost: \$22
<b>Proposal Categories:</b>	OpenStax Textbooks
<b>Requested Amount of Funding:</b>	\$15,800
<b>Original per Student Cost:</b>	\$256 if students take both courses; \$246 if students take only one course
<b>Post-Proposal Projected Student Cost:</b>	\$10, per course
<b>Projected Per Student Savings:</b>	\$236
<b>Plan for Hosting Materials:</b>	LibGuides

**Project Goals:**

Our goal is to offer low-cost, high quality learning materials for students in Introductory Physics I & II (PHYS 1111K and 1112K) at Valdosta State University by converting from the current textbook to the OpenStax College Physics textbook. If adopted for all sections of this course, ~12 per year, the projected annual savings for students would be \$70,800.

Our goal is to offer students additional no-cost Open Educational Resources (OERs) to help supplement lecture and textbook material.

By offering this new free, open access textbook and OERs, we anticipate an improvement in enrollment and DFW (Drop, Fail, and Withdraw) rates within these two courses.

We will measure the effectiveness of this transformation by comparing student's course success rates between for the courses taught using the new OERs and those taught using the traditional material as well as through student feedback on surveys provided periodically throughout each semester these courses are taught.

### **Statement of Transformation:**

The main stakeholders affected by this transformation will be the students who will gain access to a free open access textbook and educational resources starting on the first day of the semester. Many of our students come from backgrounds that can hinder the purchase of expensive textbooks and other resource materials. Often times if they are waiting on financial aid payouts, students may not be able to purchase their textbooks until the third week of classes. Since most physics textbooks, like the current required book, cost somewhere between \$140 and \$320, providing these free resources will reduce the financial burden of every student who enrolls in these courses and allow them access to course materials much sooner. Additionally, we project that by offering these resources students will be able to better meet the learning objectives for these courses and thus have greater success in completing the course.

For this transformation, we will be converting from the current purchased textbook to the OpenStax College Physics textbook. Since Biology, Chemistry, and Pre-Med students predominantly take PHYS 1111K and PHYS 1112K, this book seems to be a perfect fit. The text offers student many examples from each of the fields mentioned above, which helps students make the connection between what they are studying in physics to what they are doing within their own major. We will also be providing students open access resources from various online sources in order to give the students extra material so that they can meet the learning objectives for these courses.

Although, only two of the instructors will be using these resources during 2015-2016 academic year, our plan is to implement these changes department wide starting in Fall 2016. The implementation of the OERs and conversion from purchased textbooks will attract more students to taking these courses within our department. Additionally, this will alleviate any discontinuity students have when going from 1111K to 1112K and from one instructor to another.

### **Transformation Action Plan:**

Our action plan will have three parts: Identification and selection of materials, adoption and course redesign, and implementation and evaluation

#### Identification and selection of materials

We have already chosen to adopt the new OpenStax College Physics textbook and are in the process of identifying and locating no-cost, online resources, which can be used as

supplemental materials for instruction in this course. These resources include material found on YouTube, HyperPhysics, GALILEO, and MERLOT.

### Adoption and course redesign

During the Fall 2015 semester, we will be working to design modules on D2L, which correlate with each chapter in the College Physics textbook. Each module will include a study guide, homework set, additional problems for extra practice, quick quizzes for checking knowledge of concepts, PowerPoint slides (if used for lectures), and links or copies of the chosen education resources, which may include demonstration videos and video sample problems.

All students will have access to these resources through D2L and public access will be available through Vtext Intuitional Repository and LibGuides. Thus, students will have access to these materials anywhere they are able to access the internet. All instructors will also have open access to these materials. And since all instructors will be encouraged to use these resources for all sections of these courses, this will create continuity across the different sections of each course and between the two courses themselves.

It will be Dr. Drake's role to lead this project as subject matter expert and instructional designer and will be listed as the instructor of record in Fall 2016. Dr. Chakraborty will also work as an instructional designer helping to develop the D2L modules and will be listed as the instructor of record in Spring 2016. Mr. Holt will organize the materials in LibGuides and Vtext.

### Implementation and evaluation

We plan to implement the new outline for the course in Spring 2016. During this semester, we will be studying which resources students utilize most often through the "Completion Summary" report for each resource. Periodically, surveys will be provided to students to determine their perception of the helpfulness of each resource as well as suggestions from students on additional resources they would like to see added.

At the end of the Spring semester, data will be compiled to determine the students' perception of the course along with the DFW rates for this course. Any suggestions or changes to the modules in D2L will be made at this time. The updated materials will be used during Summer 2016 and Fall 2016 courses, with continuous evaluation throughout both semesters. More information on specific evaluations is discussed in the next section of this application.

**Quantitative & Qualitative Measures:** Throughout the length of this project, we will be using quantitative and qualitative measures to determine the impact of this transformation on student success.

#### Quantitative Measures

We will be examining three different measures throughout the length of this project: DFW rates, course enrollment data, and completion rates.

#### DFW rate

Through the department chair, we have access to the DFW rates for all students enrolled in PHYS 1111K and PHYS 1112K during the last three years. At the end of each semester, we will be comparing the DFW rates for the course taught using the new format to those using the purchased textbook.

#### Course enrollment data

Over the past three years, we have noticed a steady decline of about 15% in our PHYS 1111K and PHYS 1112K courses. Each semester we will be examining the enrollment data for these two courses. Our goal is to see if offering open access materials will increase the enrollment in these courses.

#### Completion rates

The last quantitative measure we are employing is to look at completion rates. As with the DFW rate, we have access to the completion rates for the past three years through our department chair. At the end of each semester, we will be accessing these reports to determine if the completion rate has improved by using these no-cost materials.

#### Qualitative Measures

We will be examining two different qualitative measures throughout the length of this project: student feedback through surveys and completion summary reports through D2L.

#### Student feedback through surveys

Surveys will be randomly distributed throughout each semester to students in order to gauge their perception of how helpful the textbook and the other OERs available to them on D2L appear to be. These surveys will help us to gauge student

interest as well as provide us with information on other resources the students may have found when they were studying for this course.

#### Completion Summary reports

One of the many reports available through D2L is the Completion Summary Report. These reports allow us to determine which students accessed specific materials and when they accessed it. Throughout each semester, we will be examining these reports in order to determine which resources the students utilize the most. Then at the end of the semester, we will replace any resources that students rarely use and add additional resources similar to the ones they use the most.

#### **Timeline:**

June 2015 – July 2015: Select and review OpenStax College Physics Textbook.

August 2015 - September 2015: Identify and located no-cost, online additional course materials

September 2015 - January 2016: Design modules in D2L

Spring 2016: Implement new course materials, Data collection on student achievement begins. Overload for Dr. Chakraborty, if proposal is funded.

May 2016 – June 2016: Compile data from Spring 2016 classes and revise course materials based on student feedback. Upload revised course materials to Vtext and LibGuides.

June 2016 - July 2016: Continue implementation with revisions

Fall 2016: Overload for Dr. Drake, if proposal is funded.

Spring 2017: Co-investigators compile data and revise course materials based on student feedback

#### **Budget:**

Dr. Dereth J. Drake - \$5000 for overload in Fall 2016

Dr. Shantanu Chakraborty - \$5000 for overload in Spring 2016

Mr. Michael Holt - \$5000 for salary/release time

Travel for at least two team members to attend grant kick-off meeting - \$800

**Sustainability Plan:**

The overall goal for this project is to create a master course model, which include corresponding modulus for each section of the textbook. All materials will be available to every instructor prior to the beginning of the semester through D2L and allow each instructor to customize the materials to their own teaching style. The master course and modules will be made available to faculty at all other USG institutions through Vtext Institutional Repository and LibGuides. Dr. Drake and Dr. Chakraborty will be responsible for maintaining the course materials for the foreseeable future. Mr. Holt will be responsible for maintaining the Vtext and LibGuides sites for the PHYS 1111K and 1112K materials for the foreseeable future.

---



September 5, 2015

To Whom It May Concern,

This letter is in enthusiastic support of Affordable Learning Georgia Textbook Transformation Grant proposal submitted by Dr. Dereth Drake (Assistant Professor of Physics) and Dr. Shantanu Chakraborty (Physics Instructor) in the Department of Physics, Astronomy, and Geosciences at Valdosta State University. I cannot think of a more vital and timely endeavor at this time of dwindling enrollments and soaring textbook costs in the State of Georgia than the study these fine educators have outlined.

It has been shown that the first three weeks of PHYS 1111 and PHYS 1112 classes are the most important in determining student success in a course, and many students at this stage have yet to purchase their textbook and laboratory materials due to delays in financial aid, putting them at serious risk of failure or being resolved to playing catch-up for the entire semester in that class. Not only does this project eliminate the costs of textbooks, which for Biology and Chemistry majors can be overwhelming, but provides each student with instant access to all course materials from the first day of class. Most of the course drops and withdrawals in the first few weeks of class would be prevented, and the rigor of the course can be embraced by all students equally and immediately. Therefore, the challenges of retention for the university and graduation in a timely fashion for the student are both met.

I am delighted at the clarity and simplicity of the project design, and am certain that its results will yield recommendations for essential change in how Physics course materials are accessed by students in the USG.

Sustainability of this project at Valdosta State University is particularly vital, as enrollment and retention concerns have become especially important to maintaining our Physics program. This project will serve as a pilot for a future transformation in the calculus-based PHYS 2211 and PHYS 2212 courses in the department, taught by Dr. Frank Flaherty and Dr. Dereth Drake, applications to other course series within the department such as in Astronomy and Engineering, as well as to other departments within the College of Arts and Sciences at Valdosta State University. I see this study as an essential key to success of both students and science departments in the USG.

Your consideration on this matter is greatly appreciated. Thank you.

Sincerely,

Edward E Chatelain, Head  
Physics, Astronomy, and Geosciences