Application Details

Manage Application: Textbook Transformation Grants: Round Eleven

Award Cycle:	Round 11
Internal Submission Deadline:	Tuesday, January 23, 2018

Application Title:	354
Application ID:	002074
Submitter First Name:	Rebecca
Submitter Last Name:	Rutherfoord
Submitter Title:	Department Chair, Professor of IT
Submitter Email Address:	brutherf@kennesaw.edu
Submitter Phone Number:	470-578-7399
Submitter Campus Role:	Proposal Investigator (Primary or additional)
Applicant First Name:	Rebecca
Applicant Last Name:	Rutherfoord
Applicant Email Address:	brutherf@kennesaw.edu
Applicant Phone Number:	470-578-7399
Primary Appointment Title:	Department Chair, Professor of IT
Institution Name(s):	Kennesaw State University
Co-Applicant(s):	Dr. Richard Halstead-Nussloch, Prof. Dawn Tatum, Prof. Susan VandeVen, Prof. James Rutherfoord, Zhigang Li
Submission Date:	Tuesday, January 23, 2018

Proposal Title:	354
Proposal Category:	No-Cost-to-Students Learning Materials
Final Semester of Instruction:	Fall 2018
Are you using an OpenStax textbook?:	No

Team Members (Name, Email Address):

Dr. Becky Rutherfoord - brutherf@kennesaw.edu

Dr. Rich Halstead-Nussloch - rhalstea@kennesaw.edu

Prof. Dawn Tatum - dtatum7@kennesaw.edu

Prof. Susan VandeVen - svandev@kennesaw.edu

Prof. Jim Rutherfoord - jruther3@kennesaw.edu

Dr. Zhigang Li - zli8@kennesaw.edu

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

Dr. Rebecca H. Rutherfoord

Interim Assistant Dean of the College of Computing & software Engineering, and Department Chair, Information Technology

Information Technology Department

Kennesaw State University

Course Names, Course Numbers and Semesters Offered:

IT 3123 - Hardware/Software Concepts- every semester - 3 fall, 3 spring, 2 summer

IT 3223 - Software Acquisition & Project Management- every semester - 3 fall, 3 spring, 2 summer

IT 4683 - Management of IT & Human Computer Interaction- every semester - 2 fall, 2 spring, 2 summer

IT 4723 - IT Policy and Law- every semester, every semester - 2 fall, 2 spring, 2 summer

CSE2300 - Discrete Structures- every semester - 4 fall, 4 spring, 2 summer

List the original course materials for students (including title, whether optional or required, & cost for each item):	1. IT 3123, The Architecture of Computer Hardware, Systems Software, and Networking: An Information Technology Approach, Englander, 5th edition, John Wiley and Sons, 2014; ISBN-13:978-1-118-32263-5; required; cost: $150.00; yearly enrollment: 225; total cost: $33,750.2. IT 3223, a) Guide to Software Development, Springer Pub., ISBN 978-1-4471-2299-9; required; cost: $101.20; yearly enrollment 245; total cost: $24,794 b) Fundamentals of Project Management, 4th edition, AMACON; ISBN 978-0-8144-1748-5; required; cost: $18.75; yearly enrollment 245; total cost: $4593.75. Total for class cos: $29,387.75.3. IT 4683, Using MIS 2017, Kroenke, 10th edition, ISBN 978-0-1346-0699-6; required; cost $223.15; yearly enrollment 90; total cost: $20,083.50.4. IT 4723, The Legal Environment of Business and Online Commerce, 8th edition, Cheeseman, Prentice-Hall, ISBN: 978-013-397-3310; cost: $148.15; yearly enrollment 140; total cost: $20,741.5. CSE 2300, Discrete Mathematical Structures, 6th ed, Pearson, ISBN: 978-0-13-469644-7; cost: $94.97; yearly enrollment 425; total cost: $40,362.25All cost of books are prices for new books.
Average Number of Students per Course Section:	29.6
Number of Course Sections Affected by Implementation in Academic Year:	38
Average Number of Students Per Summer Semester:	216
Average Number of Students Per Fall Semester:	420
Average Number of Students Per Spring Semester:	425

Total Number of Students Affected by Implementation in Academic Year:	1125
Requested Amount of Funding:	30,000
Original per Student Cost:	$736.22
Post-Proposal Projected Student Cost:	0
Projected Per Student Savings:	$736.22
Projected Total Annual Student Savings:	$144,324.50

Creation and Hosting Platforms Used ("n/a" if none):

Kennesaw State University D2L Brightspace

Project Goals:

In this project, we propose to take a department-wide effort to transform five required undergraduate Information Technology major courses using no-cost-to-students learning material. This project not only aims to reduce the financial burden imposed by high cost of textbooks, but also strives to develop free and open-access learning materials that offer equivalent or better educational effectiveness than traditional textbooks. These courses will then be sent through the campus Quality Matters rubric to meet institutional standards of excellence as the Information Technology degree can be completed face-to-face or completely online.

Goals:

1. Transform five required undergraduate IT major courses using no-cost-to-students learning materials

2. Create Quality Matters "ready" courses to meet institutional standards of excellence for face-to-face and online courses.

Statement of Transformation:

Research According to Priceonomics (http://priceonomics.com/which-major-has-the-most-expensive-textbooks/), an average undergraduate student annually spends $1,200 on textbooks. In addition, out of 31 majors at the University of Virginia, Computer Science (and IT) comes in 8th for the most expensive books. On the other side, the University of Virginia reports that Computer Science (and IT) textbooks only have a 25% resale value based on the original price. The highest resale value for other majors is up to 70%. Previous ALG Grant Information

One Team members was part of the round two of an "Affordable Learning Textbook Transformation Grant" in 2015 (round two, award #119). They designed and evaluated the effectiveness of no-cost-to-students learning materials for database courses in the IT department, and saved students $110,419. The assessment results showed that the developed free material offered equivalent or better learning experience than the textbooks did. The preliminary results of the grant were published in the Proceedings of Southern Association for Information Systems Conference (SAIS 2016), the final results were published in the Proceedings of the ACM Special Interests Group in IT Education (SIGITE 2016), "Transforming IT Education with No-Cost Learning Materials". They also hosted a panel discussion on no-cost learning material in IT education, at SIGITE in October 2016. The panel attracted a lot of attention among computing faculty. Many colleagues from different states were impressed with the USG initiative and with course material developed by the team. Building on our past success and lessons learned from the prior ALG grant, we will continue our transformation efforts by developing no-cost learning material for five required undergraduate IT courses. The Stakeholders There are two primary sets of stakeholders for this proposal – the students taking the five required IT classes (both in-class and online students), and the faculty developing and teaching those courses. The high cost of textbooks puts a large financial burden on students and may become a road-block for students' ability to finish their education. Our team of investigators strives to make higher education more affordable to the students. The information technology required courses listed for this grant proposal have resources that are publicly accessible, free, or with an open license to use. These materials include open and free tutorials, books, videos, labs, software, and services. One of the major problems with using regular textbooks for IT courses is that information technology material is constantly changing. Textbook publishing cannot keep up with these fast changes in the technology field. In addition, tools and software packages that are part of a textbook also become obsolete. As soon as a new version of a tool or software package is released, the instructions in a textbook become obsolete. Therefore, we need to include the latest available tools to prepare hands-on labs. Digital delivery of the learning materials makes it easier to keep the content up-to-date. Developing and assembling a set of learning materials for major courses is a unique approach. It will allow us to better align the learning material not only with the outcomes of each course, but also with the outcomes of the Information Technology program. Compared to traditional textbooks, the open source software and web resources have many benefits: 1) the Web resources are generally free to use; 2) they are constantly being updated and always reflect the latest trends and industrial development; and, 3) the materials from the Web are also more dynamic and interactive. The pitfalls of Web resources are that they are often disorganized and may contain inaccurate information. However, members of our team of investigators are not only subject matter experts in the information security field, but also proficient educators who on average have more than 10 years teaching experience including online teaching. We will select, organize and integrate resources from the web and transform the information into instructionally sound learning materials for the proposed courses including content that the team members develop themselves. We strongly believe that the new learning materials will offer up-to-date,

equivalent or better learning effectiveness compared to the original textbooks. Digital delivery also allows us to add interactive elements into the learning materials. The interactive content will not only engage the students, but also improve their learning experience. It will help to enhance the learning outcomes and learning satisfaction. The Impact The impact of our transformation efforts will be profound. By our estimates, more than 1125 students will benefit from the no-cost learning material each year. Moreover, it will benefit more students in the Bachelor of Science in Cybersecurity (eMajor) approved by the Board of Regents. One of the required courses proposed for this grant is also part of the BS in Cybersecurity. Student numbers are not included for the cybersecurity degree in this grant, but the expectation is that there will be an additional 120 students for this course per year within two years. The goal of eMajor is to reduce the cost of education by using prior learning assessments, lower tuition and potentially no-cost learning materials (https://emajor.usg.edu). The proposed project is expected to save current students $144,324.50 in textbook costs each year (not counting the cybersecurity savings). Because of the cost savings from not having to buy textbooks, students may be able to take a few more courses each year and graduate sooner. Having a series of required IT courses adopting no-cost-to-student material not only offers better and more consistent learning experience to students, but also makes our nationally renowned IT programs more affordable. As a result, our IT programs could recruit more students and produce more qualified IT professionals that Georgia needs. Our experience gained in this transformation project could be useful to other programs or departments who want to lower the cost of education to their students in IT programs across Georgia. In summary, we believe the proposed project will have a positive impact in students' retention, progression, and graduation at program, department and institution levels. As shown in the following table, the textbooks used in the five required IT undergraduate major courses are expensive. In fact, most textbooks used in Information Technology are costly in general. In addition, due to the fast evolving nature of the technology field, the textbooks used in the proposed courses are updated frequently, which negatively impacts their resale value to the students. The goal of our transformation is to replace the textbook used in the proposed courses with no-cost-to-students learning materials that offer equal or higher educational effectiveness. Data Table 1: Enrollments and Projected 2018 Enrollments of 5 IT courses Course Spring 2017 Summer 2017 Fall 2017 Total Projected 2018 Enrollment Number of Sections Total Number of students IT3123 93 40 78 211 8 225 IT3223 112 39 84 235 8 245 IT4683 0 41 41 82 6 90 IT4723 50 38 47 135 6 140 CSE2300 170 58 170 398 10 425 Total 425 216 420 1061 38 1125 As shown in the following table, the textbooks used in the five required IT undergraduate major courses are expensive. In fact, most textbooks used in Information Technology are costly in general. In addition, due to the fast evolving nature of the technology field, the textbooks used in the proposed courses are updated frequently, which negatively impacts their resale value to the students. The goal of our transformation is to replace the textbook used in the proposed courses with no-cost-to-students learning materials that offer equal or higher educational effectiveness. Table 2: Costs of Current Textbooks for 5 IT Courses Course Textbook Used Cost per Student Projected Enrollment Projected Costs IT3123 IT 3123, The Architecture of Computer Hardware, Systems Software, and Networking: An Information Technology

Approach, Englander, 5th edition, John Wiley and Sons, 2014; ISBN-13:978-1-118-32263-5; required; $150.00 225 $33,750 IT3223 3223, a) Guide to Software Development, Springer Pub., ISBN 978-1-4471-2299-9; required; cost: $101.20; total cost: $32,384. b) Fundamentals of Project Management, 4th edition, AMACON; ISBN 978-0-8144-1748-5; required; cost: $18.75 $119.95 245 $29,387.75 IT4683 IT 4683, Using MIS 2017, Kroenke, 10th edition, ISBN 978-0-1346-0699-6; required; $223.15 90 $20,083.50 IT4723 IT 4723, The Legal Environment of Business and Online Commerce, 8th edition, Cheeseman, Prentice-Hall, ISBN: 978-013-397-3310; cost: $148.15; yearly enrollment 200; total cost: $29, 630. $148.15 140 $20,741 CSE2300 CSE 2300, Discrete Mathematical Structures, 6th ed, Pearson, ISBN: 978-0-13-469644-7; cost: $94.97 $94.97 425 $40,362.25 Total: $736.22 1125 $144,324.50

Transformation Action Plan:

With a coordinated effort, our team of investigators plan the following activities to transform 5 required Information Technology courses to completely use no-cost learning materials:

1. Research and identify no cost reading materials for each of the learning modules in each course. The reading list includes both required readings and optional readings. All of these readings will be publicly accessible, free to use, or openly licensed.

2. Research and identify no cost materials that can be shared across the courses.

3. Develop study guides and lecture notes for students' use to review course content and key learning points.

4. Adopt or develop content, assignments, exercises and lab materials that are no cost to students to replace the ones in the textbooks.

5. Develop test banks to replace the ones in the textbooks.

6. Adopt open source or no-cost-to-student lab ware for students to gain hands-on experience.

7. Update the syllabus to include major resources and no cost materials.

8. Re-develop the proposed courses in our learning management system, D2L Brightspace, following Quality MattersTM standards and get the course approved for online instruction.

The responsibilities of each investigator is described as follows.

Dr. Rebecca Rutherfoord, IT 3123, Project lead; Subject matter expert, course developer and instructor of record of IT 3123.

Prof. Susan VandeVen, IT 3223, subject matter expert, course developer and instructor of record for IT 3223.

Dr. Richard Halstead-Nussloch, IT 4683, subject matter expert, course developer and instructor of record for IT 4683.

Prof. Dawn Tatum, IT 4723, subject matter expert, course developer and instructor of record for IT 4723.

Prof. James Rutherfoord, CSE 2300, subject matter expert, course developer and instructor of record for CSE 2300.

Dr. Zhigang Li, Provide Instructional Design Support to all five proposed courses.

All course design with the no-cost materials will be provided through D2L Brightspace for our students and on the ALG website for the public access.

Quantitative & Qualitative Measures: The investigators plan to assess the effectiveness of our proposal in two ways. Qualitatively, we will design a survey and gather inputs from the students after they use the no-cost learning material. Quantitatively, we will compare students' performance data gathered from sections using traditional textbooks and sections using no-cost learning material. The investigators will collect student performance data such as pass rates from the five proposed courses taught with a textbook by team members for spring, summer and fall 2017. This data will be used as a baseline for comparison of student performance in courses with alternative no cost material. Our assessment plan can be summarized as follows. 1. Student performance measures. This data is from the overall class performance based on the grading of student works. Metrics include:* Class average, grades distribution, pass rate for each grading item.* Overall letter grades distribution, pass rate, withdraw rate, and fail rate.* Percentage of students meeting or exceeding learning outcomes2. Specific survey on no-cost learning materials. A web-based survey will be developed for all proposed courses and be distributed at the end of the semester to collect student feedback. * Student perception and attitude toward no cost materials including:ratings of the no cost materials used in this coursecomments and suggestions for course improvements3. Student evaluation of the instructor. Formal student evaluation of the instructor can also provide information about teaching effectiveness using no cost materials. This evaluation is based on standardized forms for every course.For each of the measurement, the investigators are going to conduct two levels of analysis: 1) comparing the achievement levels of the course learning outcomes - generally, 75% is the aimed passing rate in undergraduate courses, and, 2) comparing the achievement levels to those from past offerings where costly textbooks were used. The investigators will use the data from the sections taught in the past 2 years.In

addition, Kennesaw State University requires all online courses to be reviewed and approved following an internal review process using Quality Matters (QM) standards. This review will insure the no-cost learning materials used or developed for the 5 required IT courses are instructionally sound. The College of Computing and Software Engineering will also conduct subject matter expert reviews for all developed courses to ensure the quality of the learning materials.

Timeline:

Spring 2018

Collect baseline statistics on each course (course developers – those faculty who are in charge of the course for this study)

Course modules redesigned to use the no cost materials. These include all new content, readings, lecture notes, video clips, exercises, labs, and assignments. The changes are reflected in the learning module study guides. (completed by course developers)

Course level assessment and informational materials redesign. This includes quizzes, tests, and syllabus. (course developers and instructional designer)

Submit the developed courses for instructional design review through Quality Matters. (instructional designer and KSU Distance Learning Center office)

Submit the developed courses for subject matter expert review. (department Chair)

Summer 2018

Develop a survey on effectiveness of the no cost materials (all course developers and instructional designer)

Teach:

IT 3123 – hardware/Software, Dr. Rutherfoord

CSE 2300 – Discrete Structures, Prof. Rutherfoord

Survey two summer courses and give student course evaluation (course developers and instructional designer)

Fall 2018

Teach:

IT 3223 – Software Acquisition and Proj. Management, Prof. VandeVen

IT 4683 – Management Information Technology & HCI, Dr. Halstead-Nussloch

IT 4723 – IT Policy and Law, Prof. Tatum

Survey three fall courses and give student course evaluation (course developers and instructional designer)

Complete final assessment data analysis and prepare a final report (all course developers and instructional designer)

Budget:

The funding mainly compensates our team of investigator's work and activity beyond normal teaching load or other job responsibilities in order to successfully complete the project. For each proposed course, course developers approximately will spend at least 80 hours in developing the no-cost learning material and be the instructor of record, and, will spend 20 hours in course assessment. Instructional support will devote at a minimum 50 hours in assisting course developers. Thus, we request the budget of this project as follows.

Dr. Rebecca Rutherfoord, Project lead; course developer and instructor of record of IT 3123, $5,000

Prof. Susan VandeVen, course developer and instructor of record for IT3223, $5,000

Dr. Richard Halstead-Nussloch, course developer and instructor of record for IT 4683, $5,000

Prof. Dawn Tatum, course developer and instructor of record for IT 4723, $5,000

Prof. James Rutherfoord, subject matter expert, course developer and instructor of record for CSE 2300, $5000

Dr. Zhigang Li, Provide Instructional Design Support to all five proposed courses, $1500

Travel: $3500, for project team members to attend the ALG kickoff and subsequent meetings to bring back information to the team members. Our project team is also planning to submit a paper to reputable IT education conference such as ACM SIGITE 2018 (Special Interest Group in IT Education). Travel money will be used to attend conferences to present findings from the grant.

Total Budget: $30,000

Only open source software or free software will be used in this project thus there is no additional spending on software or equipment purchasing.

Sustainability Plan:

The IT department implemented a course coordinator/developer system for all courses. A course coordinator/developer updates course content based on research, publications and feedback from faculty, students, alumni and our Industrial Advisory Board. Each of the investigators, except the instructional designer, is a course coordinator/developer for their corresponding course. A course coordinator/developer creates and maintains the course

materials and teaching plans. He/she also teaches the course at least once a year to make sure all resources are valid and makes necessary changes and updates. This makes sure all no-cost materials and resources are highly sustainable in the future offerings of this course. The coordinator/developer also brings major/minor course changes to the annual assessment retreat for all IT faculty.

Final Semester of Instruction: Spring 2017

January 19, 2018

ALG Grant Committee
University System of GA

Dear Colleagues:

This letter is in support of the Proposal "Staying Current in Information Technology-Transforming Required Undergraduate IT Courses" submitted from Kennesaw State University, Information Technology department faculty. As Department Chair for Information Technology, I clearly see the need for bringing down costs for our students. The ALG grants assist faculty to prepare no-cost courses that allow students to take courses without the monetary burden of expensive textbooks.

Several faculty in the Information Technology Department at Kennesaw State University have successfully carried out ALG grants for several of our undergraduate Information Technology courses. The current proposal addresses five of our required undergraduate courses in the IT curriculum. The savings already realized from the previous ALG grants encouraged our faculty to develop this new ALG grant proposal to help our students save even more money.

I strongly support this proposal. This is a very sustainable proposal as we have two Information Technology undergraduate degree programs. Many of our students take courses online as well as in-class. Creating the no-cost for textbook version of our five required undergraduate IT courses will allow students for many years to realize savings from not buying textbooks. As Information Technology material is constantly changing, the concept of not relying on just textbooks for courses is extremely important to our field.

This is a very solid proposal. All faculty participating in the previous ALG grants completed their courses and offered them successfully. Papers for several conferences, and workshops about the previous grants have been created and presented. This concept has been well received in the information technology academic community. I believe that this new ALG proposal will have the same student satisfaction and success that the previous ALG grants did. This new proposal will have a unique impact as it addresses HIT courses. Thank you for your consideration for this proposal.

Sincerely,

Rebecca H. Rutherford

Rebecca H. Rutherfoord, Ed.D.
Interim Assistant Dean of the College of Computing & Software Engineering, Department Chair for Information Technology, Professor of Information Technology
brutherf@kennesaw.edu

KENNESAW STATE UNIVERSITY
College of Computing and Software Engineering
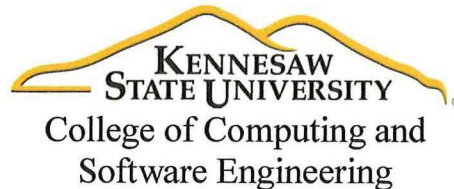
January 19, 2018

Dear Affordable Learning Georgia (ALG) Grant Reviewers,

It is my pleasure to write this letter in support of the proposal titled "Staying Current in Information Technology-Transforming Required IT Courses" submitted by Drs. Rutherfoord, Halstead-Nussloch, Li, and Ms. Tatum, Ms. VandeVen, and Mr. Rutherfoord from our Information Technology (IT) Department at Kennesaw State University.

In this project, the primary investigators will work as a team to replace existing, costly textbooks in five undergraduate information technology courses with no-cost-to-students learning materials. Their efforts will significantly lower the cost of education for students, saving over $144k per year and impacting over 1000 students per year at KSU. Additionally, this will generate a positive impact on the retention, progression, and graduation for the College of Computing and Software Engineering. Additionally, given the rapid change of the IT field, having digital materials available to students will improve the ability to keep them updated with the latest advances in the field of information technology.

The proposers have past experience with a successful ALG projects, thus the quality and success of this project is highly likely. The investigators in this project are also designated course architects who are responsible for the development and the maintenance of the to-be-transformed courses.

In conclusion, I wholeheartedly support this effort to improve access to our IT program. This proposal has the full support of the College of Computing and Software Engineering.

Sincerely,

Dr. Jon A. Preston
Interim Dean
College of Computing and Software Engineering
Kennesaw State University

Affordable Learning Georgia Textbook Transformation Grants
Rounds Ten and Eleven
For Implementations beginning Spring Semester 2018
Running Through Fall Semester 2018

Proposal Form and Narrative

-

Submitter Name	Rebecca H. Rutherfoord
Submitter Title	Department Chair, Professor of Information Technology
Submitter Email	brutherf@kennesaw.edu
Submitter Phone Number	470-578-7399
Submitter Campus Role	*Proposal Investigator (Primary)*
Applicant Name	*Rebecca Rutherfoord*
Applicant Email	brutherf@kennesaw.edu
Applicant Phone Number	470-578-7399
Primary Appointment Title	*Department Chair, Professor of Information Technology*
Institution Name(s)	Kennesaw State University
Team Members	Dr. Becky Rutherfoord - brutherf@kennesaw.edu Dr. Rich Halstead-Nussloch - rhalstea@kennesaw.edu Prof. Dawn Tatum - dtatum7@kennesaw.edu Prof. Susan VandeVen - svandev@kennesaw.edu Prof. Jim Rutherfoord - jruther3@kennesaw.edu Dr. Zhigang Li - zli8@kennesaw.edu

Sponsor, Title, Department, Institution	Dr. Rebecca H. Rutherfoord Interim Assistant Dean of the College of Computing & software Engineering, and Department Chair, Information Technology Information Technology Department Kennesaw State University				
Proposal Title	Staying Current in Information Technology-Transforming Required Undergraduate IT Courses				
Course Names, Course Numbers and Semesters Offered	IT 3123 - Hardware/Software Concepts- every semester - 3 fall, 3 spring, 2 summer IT 3223 - Software Acquisition & Project Management- every semester - 3 fall, 3 spring, 2 summer IT 4683 - Management of IT & Human Computer Interaction- every semester - 2 fall, 2 spring, 2 summer IT 4723 - IT Policy and Law- every semester, every semester - 2 fall, 2 spring, 2 summer CSE2300 - Discrete Structures- every semester - 4 fall, 4 spring, 2 summer				
Final Semester of Instruction	*Fall 2018*				
Average Number of Students Per Course Section	29.6	**Number of Course Sections Affected by Implementation in Academic Year**	38	**Total Number of Students Affected by Implementation in Academic Year**	1125
Average Number of Students Per Summer Semester	*216*				

Average Number of Students Per Fall Semester	*420*
Average Number of Students Per Spring Semester	*425*
Award Category (pick one)	☒ No-or-Low-Cost-to-Students Learning Materials ☐ Specific Core Curriculum Courses
Are you planning on using an OpenStax textbook?	☐ Yes ☒ No

	Course	Textbook Used	Cost per Student
List the original course materials for students (including title, whether optional or required, & cost for each item)	IT3123	IT 3123, The Architecture of Computer Hardware, Systems Software, and Networking: An Information Technology Approach, Englander, 5th edition, John Wiley and Sons, 2014; ISBN-13:978-1-118-32263-5; required;	$150.00
	IT3223	IT 3223, a) Guide to Software Development, Springer Pub., ISBN 978-1-4471-2299-9; required; cost: $101.20; total cost: $32,384. b) Fundamentals of Project Management, 4th edition, AMACON; ISBN 978-0-8144-1748-5; required; cost: $18.75	$119.95
	IT4683	IT 4683, Using MIS 2017, Kroenke, 10th edition, ISBN 978-0-1346-0699-6; required;	$223.15
	IT4723	IT 4723, The Legal Environment of Business and Online Commerce, 8th edition, Cheeseman, Prentice-Hall, ISBN: 978-013-397-3310; cost: $148.15; yearly enrollment 200; total cost: $29, 630.	$148.15
	CSE2300	CSE 2300, Discrete Mathematical Structures, 6th ed, Pearson, ISBN: 978-0-13-469644-7; cost: $94.97	$94.97
		Total:	$736.22
	[Material Title, optional or required]		
Requested Amount of Funding	$30,000		
Original Per Student Cost	$736.22		

Post-Proposal Projected Per Student Cost	$0
Projected Per Student Savings	$736.22
Projected Total Annual Student Savings	$144,324.50

NARRATIVE

1.1 PROJECT GOALS

In this project, we propose to take a department-wide effort to transform five required undergraduate Information Technology major courses using no-cost-to-students learning material. This project not only aims to reduce the financial burden imposed by high cost of textbooks, but also strives to develop free and open-access learning materials that offer equivalent or better educational effectiveness than traditional textbooks. These courses will then be sent through the KSU online course review process using the Quality Matters rubric to meet institutional standards of excellence as the Information Technology degree can be completed face-to-face or completely online.

Goals:

1. Transform five required undergraduate IT major courses using no-cost-to-students learning materials.

2. Create Quality Matters "ready" courses to meet institutional standards of excellence for face-to-face and online courses.

1.2   STATEMENT OF TRANSFORMATION

Research

According to Priceonomics (http://priceonomics.com/which-major-has-the-most-expensive-textbooks/), an average undergraduate student annually spends $1,200 on textbooks. In addition, out of 31 majors at the University of Virginia, Computer Science (and IT) comes in 8th for the most expensive books. On the other side, the University of Virginia reports that Computer Science (and IT) textbooks only have a 25% resale value based on the original price. The highest resale value for other majors is up to 70%.

Previous ALG Grant Information

One team member was part of the round two of an "Affordable Learning Textbook Transformation Grant" in 2015 (round two, award #119). They designed and evaluated the effectiveness of no-cost-to-students learning materials for database courses in the IT department, and saved students $110,419. The assessment results showed that the developed free material offered equivalent or better learning experience than the textbooks did. The preliminary results of the grant were published in the Proceedings of Southern Association for Information Systems Conference (SAIS 2016), the final results were published in the Proceedings of the ACM Special Interests Group in IT Education (SIGITE 2016), "Transforming IT Education with No-Cost Learning Materials". They also hosted a panel discussion on no-cost learning material in IT education, at SIGITE in October 2016. The panel attracted a lot of attention among computing faculty. Many colleagues from different states were impressed with the USG initiative and with course material developed by the team. Building on our past success and lessons learned from the prior ALG grant, we will continue our transformation efforts by developing no-cost learning material for five required undergraduate IT courses.

The Stakeholders

There are two primary sets of stakeholders for this proposal – the students taking the five required IT classes (both in-class and online students), and the faculty developing and teaching those courses. The high cost of textbooks puts a large financial burden on students and may become a road-block for students' ability to finish their education. Our team of investigators strives to make higher education more affordable to the students. The information technology required courses listed for this grant proposal have resources that are publicly accessible, free, or with an open license to use. These materials include open and free tutorials, books, videos, labs, software, and services. One of the major problems with using regular textbooks for IT courses is that information technology material is constantly changing. Textbook publishing cannot keep up with these fast changes in the technology field. In addition, tools and software packages that are part of a textbook also become obsolete. As soon as a new version of a tool or software package is released, the instructions in a textbook become obsolete. Therefore, we need to include the latest available tools to prepare hands-on labs. Digital delivery of the learning materials makes it easier to keep the content up-to-date. Developing and assembling a set of learning materials for major courses is a unique approach. It will allow us to better align the learning material not only

with the outcomes of each course, but also with the outcomes of the Information Technology program.

Compared to traditional textbooks, the open source software and web resources have many benefits: 1) the Web resources are generally free to use; 2) they are constantly being updated and always reflect the latest trends and industrial development; and, 3) the materials from the Web are also more dynamic and interactive. The pitfalls of Web resources are that they are often disorganized and may contain inaccurate information. However, members of our team of investigators are not only subject matter experts in the information security field, but also proficient educators who on average have more than 10 years teaching experience including online teaching. We will select, organize and integrate resources from the web and transform the information into instructionally sound learning materials for the proposed courses including content that the team members develop themselves. We strongly believe that the new learning materials will offer up-to-date, equivalent or better learning effectiveness compared to the original textbooks. Digital delivery also allows us to add interactive elements into the learning materials. The interactive content will not only engage the students, but also improve their learning experience. It will help to enhance the learning outcomes and learning satisfaction.

The Impact

The impact of our transformation efforts will be profound. By our estimates, more than 1125 students will benefit from the no-cost learning material each year. Moreover, it will benefit more students in the Bachelor of Science in Cybersecurity (eMajor) approved by the Board of Regents. One of the required courses proposed for this grant is also part of the BS in Cybersecurity. Student numbers are not included for the cybersecurity degree in this grant, but the expectation is that there will be an additional 120 students for this course per year within two years. The goal of eMajor is to reduce the cost of education by using prior learning assessments, lower tuition and potentially no-cost learning materials (https://emajor.usg.edu). The proposed project is expected to save current students $144,324.50 in textbook costs each year (not counting the cybersecurity savings).

Because of the cost savings from not having to buy textbooks, students may be able to take a few more courses each year and graduate sooner. Having a series of required IT courses adopting no-cost-to-student material not only offers better and more consistent learning experience to students, but also makes our nationally renowned IT programs more affordable. As a result, our IT programs could recruit more students and produce more qualified IT professionals that Georgia needs. Our experience gained in this transformation project could be useful to other programs or departments who want to lower the cost of education to their students in IT programs across Georgia. In summary, we believe the proposed project will have a positive impact in students' retention, progression, and graduation at program, department and institution levels.

As shown in the following table, the textbooks used in the five required IT undergraduate major courses are expensive. In fact, most textbooks used in Information Technology are costly in general. In addition, due to the fast evolving nature of the technology field, the textbooks used in the proposed courses are updated frequently, which negatively impacts their resale value to the

students. The goal of our transformation is to replace the textbook used in the proposed courses with no-cost-to-students learning materials that offer equal or higher educational effectiveness.

Data

Table 1: Enrollments and Projected 2018 Enrollments of 5 IT courses

Course	Spring 2017	Summer 2017	Fall 2017	Total	Projected 2018 Enrollment	
					Number of Sections	Total Number of students
IT3123	93	40	78	211	8	225
IT3223	112	39	84	235	8	245
IT4683	0	41	41	82	6	90
IT4723	50	38	47	135	6	140
CSE2300	170	58	170	398	10	425
Total	**425**	**216**	**420**	**1061**	**38**	**1125**

As shown in the following table, the textbooks used in the five required IT undergraduate major courses are expensive. In fact, most textbooks used in Information Technology are costly in general. In addition, due to the fast evolving nature of the technology field, the textbooks used in the proposed courses are updated frequently, which negatively impacts their resale value to the students. The goal of our transformation is to replace the textbook used in the proposed courses with no-cost-to-students learning materials that offer equal or higher educational effectiveness.

Table 2: Costs of Current Textbooks for 5 IT Courses

Course	Textbook Used	Cost per Student	Projected Enrollment	Projected Costs
IT3123	IT 3123, The Architecture of Computer Hardware, Systems Software, and Networking: An Information Technology Approach, Englander, 5th edition, John Wiley and Sons, 2014; ISBN-13:978-1-118-32263-5; required;	$150.00	225	$33,750
IT3223	IT 3223, a) Guide to Software Development, Springer Pub., ISBN 978-1-4471-2299-9; required; cost: $101.20; total cost: $32,384. b) Fundamentals of Project Management, 4th edition, AMACON; ISBN 978-0-8144-1748-5; required; cost: $18.75	$119.95	245	$29,387.75
IT4683	IT 4683, Using MIS 2017, Kroenke, 10th edition, ISBN 978-0-1346-0699-6; required;	$223.15	90	$20,083.50
IT4723	IT 4723, The Legal Environment of Business and Online Commerce, 8th edition, Cheeseman, Prentice-Hall, ISBN: 978-013-397-3310; cost: $148.15; yearly enrollment 200; total cost: $29, 630.	$148.15	140	$20,741
CSE2300	CSE 2300, Discrete Mathematical Structures, 6th ed, Pearson, ISBN: 978-0-13-469644-7; cost: $94.97	$94.97	425	$40,362.25
	Total:	$736.22	1125	$144,324.50

1.3   TRANSFORMATION ACTION PLAN

With a coordinated effort, our team of investigators plan the following activities to transform 5 required Information Technology courses to completely use no-cost learning materials:

- Research and identify no cost reading materials for each of the learning modules in each course. The reading list includes both required readings and optional readings. All of these readings will be publicly accessible, free to use, or openly licensed.

- Research and identify no cost materials that can be shared across the courses.

- Develop study guides and lecture notes for students' use to review course content and key learning points.

- Adopt or develop content, assignments, exercises and lab materials that are no cost to students to replace the ones in the textbooks.

- Develop test banks to replace the ones in the textbooks.

- Adopt open source or no-cost-to-student lab ware for students to gain hands-on experience.

- Update the syllabus to include major resources and no cost materials.

- Re-develop the proposed courses in our learning management system, D2L Brightspace, following Quality Matters™ standards and get the course approved for online instruction.

The responsibilities of each investigator is described as follows.

Dr. Rebecca Rutherfoord, IT 3123, Project lead; Subject matter expert, course developer and instructor of record of IT 3123.

Prof. Susan VandeVen, IT 3223, subject matter expert, course developer and instructor of record for IT 3223.

Dr. Richard Halstead-Nussloch, IT 4683, subject matter expert, course developer and instructor of record for IT 4683.

Prof. Dawn Tatum, IT 4723, subject matter expert, course developer and instructor of record for IT 4723.

Prof. James Rutherfoord, CSE 2300, subject matter expert, course developer and instructor of record for CSE 2300.

Dr. Zhigang Li, Provide Instructional Design Support to all five proposed courses.

All course design with the no-cost materials will be provided through D2L Brightspace for our students and on the ALG website for the public access.

1.4   QUANTITATIVE AND QUALITATIVE MEASURES

The investigators plan to assess the effectiveness of our proposal in two ways. Qualitatively, we will design a survey and gather inputs from the students after they use the no-cost learning material. Quantitatively, we will compare students' performance data gathered from sections using traditional textbooks and sections using no-cost learning material.

The investigators will collect student performance data such as pass rates from the five proposed courses taught with a textbook by team members for spring, summer and fall 2017. This data will be used as a baseline for comparison of student performance in courses with alternative no cost material. Our assessment plan can be summarized as follows.

1. Student performance measures. This data is from the overall class performance based on the grading of student works. Metrics include:

    * Class average, grades distribution, pass rate for each grading item.

    * Overall letter grades distribution, pass rate, withdraw rate, and fail rate.

    * Percentage of students meeting or exceeding learning outcomes

2. Specific survey on no-cost learning materials. A web-based survey will be developed for all proposed courses and be distributed at the end of the semester to collect student feedback.

    * Student perception and attitude toward no cost materials including:

        • ratings of the no cost materials used in this course

        • comments and suggestions for course improvements

3. Student evaluation of the instructor. Formal student evaluation of the instructor can also provide information about teaching effectiveness using no cost materials. This evaluation is based on standardized forms for every course.

For each of the measurement, the investigators are going to conduct two levels of analysis: 1) comparing the achievement levels of the course learning outcomes - generally, 75% is the aimed passing rate in undergraduate courses, and, 2) comparing the achievement levels to those from past offerings where costly textbooks were used. The investigators will use the data from the sections taught in the past 2 years.

In addition, Kennesaw State University requires all online courses to be reviewed and approved following an internal review process using Quality Matters (QM) standards. This review will insure the no-cost learning materials used or developed for the 5 required IT courses are instructionally sound. The College of Computing and Software Engineering will also conduct subject matter expert reviews for all developed courses to ensure the quality of the learning materials.

1.5   TIMELINE

Spring 2018

- Collect baseline statistics on each course (course developers – those faculty who are in charge of the course for this study)

- Course modules redesigned to use the no cost materials. These include all new content, readings, lecture notes, video clips, exercises, labs, and assignments. The changes are reflected in the learning module study guides. (completed by course developers)

- Course level assessment and informational materials redesign. This includes quizzes, tests, and syllabus. (course developers and instructional designer)

- Submit the developed courses for instructional design review through Quality Matters. (instructional designer and KSU Distance Learning Center office)

- Submit the developed courses for subject matter expert review. (department Chair)

Summer 2018

- Develop a survey on effectiveness of the no cost materials (all course developers and instructional designer)

- Teach:

     o   IT 3123 – hardware/Software, Dr. Rutherfoord

     o   CSE 2300 – Discrete Structures, Prof. Rutherfoord

- Survey two summer courses and give student course evaluation (course developers and instructional designer)

Fall 2018

- Teach:

     o   IT 3223 – Software Acquisition and Proj. Management, Prof. VandeVen

     o   IT 4683 – Management Information Technology & HCI, Dr. Halstead-Nussloch

     o   IT 4723 – IT Policy and Law, Prof. Tatum

- Survey three fall courses and give student course evaluation (course developers and instructional designer)

- Complete final assessment data analysis and prepare a final report (all course developers and instructional designer)

1.6 BUDGET

The funding mainly compensates our team of investigator's work and activity beyond normal teaching load or other job responsibilities in order to successfully complete the project. For each proposed course, course developers approximately will spend at least 80 hours in developing the no-cost learning material and be the instructor of record, and, will spend 20 hours in course assessment. Instructional support will devote at a minimum 50 hours in assisting course developers. Thus, we request the budget of this project as follows.

Dr. Rebecca Rutherfoord, Project lead; course developer and instructor of record of IT 3123, $5,000

Prof. Susan VandeVen, course developer and instructor of record for IT3223, $5,000

Dr. Richard Halstead-Nussloch, course developer and instructor of record for IT 4683, $5,000

Prof. Dawn Tatum, course developer and instructor of record for IT 4723, $5,000

Prof. James Rutherfoord, subject matter expert, course developer and instructor of record for CSE 2300, $5000

Dr. Zhigang Li, Provide Instructional Design Support to all five proposed courses, $1,500

Travel: $3,500, for project team members to attend the ALG kickoff and subsequent meetings to bring back information to the team members. Our project team is also planning to submit a paper to reputable IT education conference such as ACM SIGITE 2018 (Special Interest Group in IT Education). Travel money will be used to attend conferences to present findings from the grant.

Total Budget: $30,000

Only open source software or free software will be used in this project thus there is no additional spending on software or equipment purchasing.

1.7 SUSTAINABILITY PLAN

The IT department implemented a course coordinator/developer system for all courses. A course coordinator/developer updates course content based on research, publications and feedback from faculty, students, alumni and our Industrial Advisory Board. Each of the investigators, except the instructional designer, is a course coordinator/developer for their corresponding course. A course coordinator/developer creates and maintains the course materials and teaching plans. He/she also teaches the course at least once a year to make sure all resources are valid and makes necessary changes and updates. This makes sure all no-cost materials and resources are highly sustainable in the future offerings of this course. The coordinator/developer also brings major/minor course changes to the annual assessment retreat for all IT faculty.

1.8   REFERENCES & ATTACHMENTS

A letter of support must be provided from the sponsoring area (unit, office, department, school, library, campus office of the Vice President for Academic Affairs, etc.) that will be responsible for receipt and distribution of funding. Letters must reference sustainability. In the case of multi-institutional affiliations, all participants' institutions/departments must provide a letter of support.