Affordable Materials Grants, Round 18:

Transformation Grants

(Fall 2020 – Fall 2021)

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 18 RFP Page](https://www.affordablelearninggeorgia.org/about/rfp_r18).
* The italic text provided below is meant for clarifications and can be deleted.

# Applicant and Team Information

*The* ***applicant*** *is the proposed Project Lead for the grant project. The* ***submitter*** *is the person submitting the application (which may be a Grants Officer or Administrator). The submitter will often be the applicant—if so, just list leave the submitter blank.*

| Requested information | Answer |
| --- | --- |
| Institution(s) | Kennesaw State University |
| Applicant name | Rebecca Rutherfoord |
| Applicant email  | brutherf@kennesaw.edu |
| Applicant position/title | Department Chair of Information Technology |
| Submitter name  | Rebecca Rutherfoord |
| Submitter email  | brutherf@kennesaw.edu |
| Submitter position/title | Department Chair of Information Technology |

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 | Maria Valero | Mvalero2@kennesaw.edu |
| Team member 2 | Seyedamin Pouriyeh | spouriye@kennesaw.edu |
| Team member 3 | Richard Halstead-Nussloch | rhalstea@kennesaw.edu |
| Team member 4 | Becky Rutherfoord | brutherf@kennesaw.edu |
| Team member 5 | Brichaya Shah | Bshah4@kennesaw.edu |
| Team member 6 | Student  | (will be selected if grant is approved) |

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

|  |
| --- |
|  |

# Project Information

| Requested information | Answer |
| --- | --- |
| Priority Category / Categories*Projects in these categories will receive three extra points in the final score for fitting a priority of these particular rounds of Transformation Grants. The type of funding for the project is determined by the funding categories criteria above. As of Round 18, projects can be a part of more than one category. Note that the below categories only indicate priority, not which applications qualify for a grant. Select all that apply.* | *Priority categories:* * ***Collaborative Projects with Professional Support***
* ***Student Participation in Materials Evaluation and/or Development***
* ***Departmental Scaling Projects***
* *Upper-Level Campus Collaborations*
 |
| Requested Total Amount of Funding*$30,000 maximum total award per grant* | *$24,000* |
| Final Semester of Project | *Fall 2021* |
| Using OpenStax Textbook?*This is to indicate to OpenStax that they can provide additional support and resources to your team during the adoption process.* | *No* |

# Impact Data

Please fill in the data below with impact data in below with *one course taught by one instructor* in each table, 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.**

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 | IT 6853 Computer Forensics |
| N/A | Course instructor | Maria Valero |
| 1 | Average number of students enrolled per section | 26 |
| 2 | Average number of affected course sections scheduled in a summer semester | 0 |
| 3 | Average number of affected course sections scheduled in a fall semester | 1 |
| 4 | Average number of affected course sections scheduled in a spring semester | 2 |
| 5 | Total number of course sections scheduled in an academic year *Add up rows 2-4.* | 3 |
| 6 | Total number of student section enrollments per academic year*Multiply row 1 and row 5.* | 76.5 |
| 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.* | *Guide to Computer Forensics and Investigations,* Nelson, 6th ed., 2019, Cengage Publishing, ISBN: 9781337568944 |
| 8 | Original cost per student section enrollment*Add up the cost of all materials in row 7.* | $192.30 |
| 9 | Average post-project cost per student section enrollment | 0 |
| 10 | Average post-project savings per student section enrollment*Subtract row 9 from row 8.* | $192.30 |
| 11 | Projected total annual student savings per academic year*Multiply row 10 and row 6.* | $14,710.95 |

## Course 2

|  |  |  |
| --- | --- | --- |
| Row # | Requested information | Answer |
| N/A | Course title and number | IT 6683 Management of IT |
| N/A | Course instructor | Richard Halstead-Nussloch |
| 1 | Average number of students enrolled per section | 21 |
| 2 | Average number of course sections scheduled in a summer semester | 1 |
| 3 | Average number of course sections scheduled in a fall semester | 0 |
| 4 | Average number of course sections scheduled in a spring semester | 1 |
| 5 | Total number of course sections scheduled in an academic year *Add up rows 2-4.* | 2 |
| 6 | Total number of student section enrollments per academic year*Multiply row 1 and row 5.* | 42 |
| 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.* | IT Manager’s Handbook, 3rd ed., Holtsnider, B., and Jaffe, B.D., 2012, Morgan Kauffman, ISBN: 9780124159495 |
| 8 | Original cost per student section enrollment*Add up the cost of all materials in row 7.* | $49.95 |
| 9 | Average post-project cost per student section enrollment | 0 |
| 10 | Average post-project savings per student section enrollment*Subtract row 9 from row 8.* | $49.95 |
| 11 | Projected total annual student savings per academic year*Multiply row 10 and row 6.* | $2,097.90 |

## Course 3

|  |  |  |
| --- | --- | --- |
| Row # | Requested information | Answer |
| N/A | Course title and number | IT 4853 Computer Forensics |
| N/A | Course instructor | Seyedamin Pouriyeh |
| 1 | Average number of students enrolled per section | 37 |
| 2 | Average number of course sections scheduled in a summer semester | 1 |
| 3 | Average number of course sections scheduled in a fall semester | 2 |
| 4 | Average number of course sections scheduled in a spring semester | 1 |
| 5 | Total number of course sections scheduled in an academic year *Add up rows 2-4.* | 4 |
| 6 | Total number of student section enrollments per academic year*Multiply row 1 and row 5.* | 148 |
| 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.* | *Guide to Computer Forensics and Investigations,* Nelson, 6th ed., 2019, Cengage Publishing, ISBN: 9781337568944 |
| 8 | Original cost per student section enrollment*Add up the cost of all materials in row 7.* | $192.30 |
| 9 | Average post-project cost per student section enrollment | 0 |
| 10 | Average post-project savings per student section enrollment*Subtract row 9 from row 8.* | $192.30 |
| 11 | Projected total annual student savings per academic year*Multiply row 10 and row 6.* | $28,460.40 |

## Course 4

|  |  |  |
| --- | --- | --- |
| Row # | Requested information | Answer |
| N/A | Course title and number |  |
| N/A | Course instructor |  |
| 1 | Average number of students enrolled per section |  |
| 2 | Average number of course sections scheduled in a summer semester |  |
| 3 | Average number of course sections scheduled in a fall semester |  |
| 4 | Average number of course sections scheduled in a spring semester |  |
| 5 | Total number of course sections scheduled in an academic year *Add up rows 2-4.* |  |
| 6 | Total number of student section enrollments per academic year*Multiply row 1 and row 5.* |  |
| 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.* |  |
| 8 | Original cost per student section enrollment*Add up the cost of all materials in row 7.* |  |
| 9 | Average post-project cost per student section enrollment |  |
| 10 | Average post-project savings per student section enrollment*Subtract row 9 from row 8.* |  |
| 11 | Projected total annual student savings per academic year*Multiply row 10 and row 6.* |  |

# Narrative Section

## 1. Project Goals

**The project goals include:**

1. **Create a cost savings for each student taking 1 or more of the courses listed in the project by not having to purchase a textbook.**
2. **Create no-cost materials for each course that will ensure student success at the same or higher level than having students use the textbook for the course.**
3. **Create current, relevant no-cost materials for each course in the project. These materials include: new content for each learning module; create new power points with voice for each module in each course; new video links for each learning module in each course that are current and relevant; new text-based links for each learning module in each course that are current and relevant; links to free textbooks (if available) for each course in the project; links to other current and relevant materials for each course in the project.**
4. **The course materials should be equivalent or better than the traditional textbook for each course in the project.**
5. **Students should be able to achieve the learning outcomes at the same percentage of success as prior courses that used the textbook; this is accomplished by using the newly developed materials in each course module that support the learning outcomes of the course.**
6. **Students will continue their experience with “no-cost” courses that have been available to them as IT majors for over the last three years, thus, completing the “no-cost” pedagogical transformation for the BSIT and MSIT degrees.**

## 2. Statement of Transformation

## **Description of Project, current state of courses and impact:**

The project for this Transformation Grant application is to re-develop three courses – two from the Master of Science in Information Technology (MSIT), and one from the Bachelor of Science in Information Technology (BSIT). The courses are IT 6853 Computer Forensics, IT 6683 Management of Information Technology, and IT 4853 Computer Forensics.

The current state of each of these courses is that each has a current textbook that they are using that students must purchase. The cost of the textbooks is listed above. The courses are offered at a minimum twice per academic year (fall/spring/summer).

One of the strategic goals of the Information Technology Department has been to develop both the MSIT and the BSIT degree programs (the BSIT program includes courses that make up the BASIT program – Bachelor of Applied Science in Information Technology that is a 2+2 transfer program from the Technical Colleges in Georgia to Kennesaw State University in IT) as “Z” degrees. Both degrees have been extremely fortunate in securing ALG grants in the past that support our strategic goal. These three courses are the last three that have not yet been developed with fully no-cost content.

The impact of developing these three courses is as follows:

1. The IT 6853 Computer Forensics course will now be able to offer the students the most up-to-date content in the computer forensics area. This is one area that is constantly changing.
	1. <https://en.wikipedia.org/wiki/Computer_forensics>
	2. <https://www.businessnewsdaily.com/10893-free-computer-forensics-training-resources.html>
	3. <https://www.guru99.com/digital-forensics.html>
2. The IT 6683 Management of Information Technology course will be able to take advantage of many free online textbooks, and other free resources.
	1. <https://scholar.google.com/scholar?q=Management+of+Information+Technology&hl=en&as_sdt=0&as_vis=1&oi=scholart>
	2. <https://en.wikipedia.org/wiki/Information_technology_management>
3. The IT 4853 Computer Forensics course will be able to give students the advantage of having the most up-to-date materials that are many times out of date from a traditional textbook.
	1. <https://en.wikipedia.org/wiki/Computer_forensics>
	2. <https://www.businessnewsdaily.com/10893-free-computer-forensics-training-resources.html>
	3. <https://www.guru99.com/digital-forensics.html>
4. The three courses, if re-developed as no-cost courses, will impact our students in the Information Technology MSIT and BSIT degree programs. We have over 800+ BSIT students, and around 300 MSIT students. These three courses are all elective courses in the degree program. However, the two forensics courses are both extremely popular with our students. Both the BSIT and MSIT students choose 15 hours (5 courses) for their degree program and Computer Forensics is chosen by at least ½ of the majors. This will save these students the cost of the current textbook for the course.

The Management of IT course is also a popular course for the MSIT degree. Since this is a master’s program, many students wish to have at least 1 management course concerning the IT enterprise.

1. The university is very supportive of the Information Technology department working on becoming “Z” degrees for the BSIT and MSIT programs. With tuition normally rising each year, and the cost of STEM technical textbooks also going up, the university sees the benefit for the students in having a no-cost option. In fact, in our course bulletin, courses are marked as either “no cost” or “low-cost” options.

**The need for “no-cost” materials:**

The field of Information Technology is one that is constantly changing. Technology advances are occurring at a very fast pace. Creating a university degree program in IT is very challenging. Most IT textbooks are “out-of-date” when they are published. The traditional publishing cycle takes too long to keep up with the changes.

Our students need us to present them with the most current, relevant and significant course materials that we can. The advent of the OER materials and the assistance of the ALG grants, have allowed the Information Technology Department BSIT and MSIT degrees to be at the leading edge with the most up-to-date material possible. Our students are benefiting by not only meeting all course and program outcomes, but they do this with the most current materials. This allows them to be much more valuable to the IT industry – particularly in the Atlanta area and the State of Georgia.

**Description of the Courses:**

## **IT 6853 Computer Forensics**

This course is taught regularly as part of the focus area “IT Security” in the Master of Science in Information Technology, College of Computing and Software Engineering, at Kennesaw State University. Usually at a minimum 3 sections of this course are offered each academic year. This focus area requires 4-5 courses to complete. The course currently uses a textbook in the forensics area as noted above.

The Student Outcomes for this course are:

• Describe the role of computer forensics professionals.

• Analyze hard disks and File System in Window and Linux OS.

• Perform data carving and steganography.

• Evaluate digital forensics tools for web browser, network, and email forensics.

• Recover passwords, analyze log data files, and create professional forensic reports

**The following resources will be created during the project.**

1. A set of new learning materials including readings and links

2. Newly developed content material for the module

3. Customized content slides to provide OER instead of commercial book chapters and slides.

The faculty member will update the materials during the period in the following way:

(a) For each module, new slides and study guides with learning resources will be provided to the student; for example, in the module "Linux File System and Forensic Artifacts", interactive slides explaining the Hex Dump of the file system will be developed, so the student can analyze step by step of the forensic process and visualize the final data extraction of the file system information. (b) Each module will have one hands-on lab to evaluate and measure the learning outcome; for example, in the module "Network Forensics", the student will complete a NetLab+ lab that includes the use of different virtual machines (provided by the tool) and use commands for capturing and analyzing packets; all this without using external paid tools.

(c) Each module will incorporate a set of up-to-date papers as recommended readings with different case studies in computer forensics. For example, with the support of the KSU library, the faculty member will develop a "Computer Forensic Wiki". The Wiki will be a website with relevant information and links to new papers in the computer forensic field.

(d) Each module will include recording videos of the faculty member explaining the details of the most important parts of the topic. Besides lectures, the faculty will develop a set of small videos on computer forensics techniques to give the student precise and concise information about how to conduct determined investigations. For example, in the module "Data Acquisition", short videos about how to use different commands to create disk images in different operating systems will be provided, so the student can quickly refer to them when needed.

All modules with the new material will support one or more of the course learning outcomes. The subject matter expert/editor will ensure that every course learning outcome is supported by the learning material, and assessed through one of the chosen activities in the course – such as a hands-on lab, discussion or quiz/test.

The course has a total of 15 modules. To develop the materials, slides, hands-on lab structures, Wiki papers, videos, and added links, the faculty member estimates time of 2.5 weeks for each module, which represents approximately 38 weeks (this represents the 73% of the project time). Another 26% of the time will be used to improve, evaluate, and modify materials according to the college and other faculties' inputs. The aforementioned works match the budget of $5000 for developing this course. The budget will be invested in the faculty member that will develop the materials and the "Computer Forensics Wiki."

## 3. Action Plan

*Transformation Grant projects are work-intensive and require project management in order to be successful. This section allows teams to describe how the team will fulfill the goals of the project. This section must include:*

* *The role(s) of each team member in the project with details as to the major tasks team members will complete, with an estimate of how long each task will take (e.g. number of hours).*
* *A review of existing open, no-cost, and/or low-cost course materials for the course(s).*
* *The plan for the selection, adoption, adaptation, and/or creation of new course materials (if applicable). Include plans for open licensing and plans for making your materials accessible.*
* *The plan for redesigning your course(s), including any instructional design work, curriculum alignment, course accessibility changes, etc.*
* *The plan for providing open access to the new materials. Affordable Learning Georgia will host any newly created materials in our repository; please indicate if you are using other platforms in addition to the repository to host them.*

The role of each course developer will be to create or add: a) new content, b) new power point slides with voice, c) new video links, d) new test links, e) new assignments based upon the new material and f) new quizzes/tests based upon the new material. Each course is explained in more detail below.

**Courses in the Project:**

**IT 6683 Management of IT – Dr. Richard Halstead-Nussloch**

This course is taught regularly as part of the focus area “Enterprise Management” in the Master of Science in Information Technology, College of Computing and Software Engineering, at Kennesaw State University. Usually at a minimum 2 sections of this course are offered each academic year. This focus area requires 4-5 courses to complete. The course currently uses a textbook in the management of information technology area as noted above.

The student Outcomes for this course are:

1. Define and discuss major IT concepts and terms and link them to business processes.

2. Formulate an approach to the management of IT based on the needs of the business

3. Identify and implement best practices and methods for:

a. Working professionally both individually and on a team

b. Identifying business, information and technology needs in the organization

c. Characterizing management structures of the organization

d. Managing the planning, control, finances, resources, people, operations, resilience and decision-making of IT in the organization to support its business, information and technology needs

4. Perform independent research and/or business-case analysis valuable to the management of IT, e.g. technology provisioning in a data center or disaster response and recovery plans

**Preliminary review of the existing resources to meet these outcomes:**

<https://cio-wiki.org/wiki/Main_Page> The CIO-Wiki material is available under a Creative Commons Share Alike License. It covers classical (e.g., IT operations) and contemporary (e.g., managing the cloud) topics in the management of IT. As of September 2020, it has over 4,000 topics. The CIO-Wiki covers all five learning outcomes for IT6683. In reviewing its prior use in our IT curriculum, accuracy and scope are at least 85%.

<https://www.educause.edu/> The EDUCAUSE is the website and public repository for the largest IT community of practice devoted to IT in support of higher education. The site curates crowd-sourced and crowd-peer-reviewed materials across the full range of topics covering management of IT for higher education under a Creative Commons Attribution-Share Alike Public License. An additional advantage for using EDUCAUSE.edu for an academic course is that our students have direct experience of all issues discussed, as they are enrolled in our university. KSU is a member of EDUCAUSE, which means that faculty can be authenticated for early access (prior to official publication date), but once the publication date has been reached, the material is available on the public website. EDUCAUSE.edu covers all five learning outcomes for IT6683. In reviewing its prior use in our IT curriculum, accuracy and scope are at least 90%.

<https://www.wikipedia.org/> The Wikipedia website has a wide range of mostly acceptable articles and sub-portals covering the management of IT available under a Creative Commons Attribution-Share Alike Unported License. A distinct advantage is that technical language and IT jargon is reduced. Examples of clear communication with lay personnel is exceedingly important to success in managing IT. Wikipedia is most useful for learning outcomes 1, 2, and 5 for IT6683. In reviewing its prior use in our IT curriculum, accuracy and scope for Wikipedia are at least 70% and average around 85%. Past group projects in this and similar MSIT classes have corrected and/or enhanced Wikipedia articles covering IT issues.

Varied government websites including, e.g., NIST.gov, usability.gov, dau.edu, data.gov, code.gov, and <https://gta.georgia.gov/> have a wide range of public-domain materials covering the management of IT. A distinct advantage for many of our MSIT students is that they work for a branch of the Federal or State of Georgia Government or an organization that does business with the Federal Government or State of Georgia. Material from government websites covers all five learning outcomes for IT6683. In reviewing its prior use in our IT curriculum, accuracy and scope are at least 90%.

IT industry websites contain many reports, guides, tutorials, white papers, etc. that are pertinent and valuable to the management of IT. Terms, conditions, and licenses vary widely and if allowed, pertinent materials from industry sites (e.g., ibm.com) are linked to in the course materials. In reviewing its prior use in our IT curriculum, accuracy and scope are at least 80%.

**Timeline with tasks:**

10/30/20 through 12/31/20-

IT6683-Task 1: Implement and complete the set-up for a stakeholder (faculty, students, industry advisors) review of the current textbook’s topical map to the IT6683 Learning Outcomes plus additional topics needed to be included and mapped to the course’s learning outcomes. Also begin collection of the external resources for the course. This set-up activity is expected to require 20 hours and is a part of ongoing course curriculum and improvement activities.

1/1/21 through 2/28/21-

IT6683-Task 2: Complete collection of external “free” resources for the course. Begin working on design and development of the new modules for the course. Decide how many modules the course will have and the template design each module will follow. This will include “look and feel” design of each module. This task is expected to require 30 hours.

3/1/21 through 5/31/21-

IT6683-Task 3: Implement and complete course design to implement textbook replacement of the seven learning modules in the current IT6683 course. For each module, the textbook material will be replaced with OER material supplemented with instructor notations, lab exercises, reflective discussions (for both synchronous and asynchronous completion), and a project with incremental submissions. This task is expected to require 80 hours and is the central task of the project. It will produce the OER material organized within the IT6683 learning modules and complete with instructor notations; appropriate lab exercises, linked reflective discussion questions, and a project assignment to integrate all the material.

6/1/21 through 8/31/21-

IT6683-Task 4 IT6853-Task 4: The subject matter expert will evaluate the “draft” course modules, paying close attention to the attainment of course outcomes. The instructional designer will evaluate the course based upon navigation, “look and feel”, and ADA compliance. The student will go through the course navigation, look at numbers of assignments, discussions, tests/quizzes, etc., and evaluate it from a student perspective on being able to complete the course. Any corrections will be sent back to the faculty member to make. The SME’s activities are expected to be 45 hours in total. The Instructional Designer’s activities are expected to take approximately 30 hours in total. The student’s activities are to simulate “taking” the course by looking at content, all links, assignments, discussions, tests/quizzes, etc., and evaluate the course as the amount of work required and whether or not the course appears to meet the course outcomes. This will take approximately 200 hours in total for the student (20 hr/wk for 10 weeks). The changes that may need to be made by the faculty member are assumed to take 30 hours in total.

9/1/21 through 12/31/21-

IT6683-Task5: Teach the course during fall 2021 semester. Implement the student assessment survey at the end of the course, and present the findings of the survey to the Project Director for inclusion into the final project report. Post the created IT6683 materials on the publishing website. The additional work above teaching the course will take 10 hours.

## **IT 6853 Computer Forensics- Dr. Maria Valero de Clemente**

This course is taught regularly as part of the focus area “IT Security” in the Master of Science in Information Technology, College of Computing and Software Engineering, at Kennesaw State University. Usually at a minimum 3 sections of this course are offered each academic year. This focus area requires 4-5 courses to complete. The course currently uses a textbook in the forensics area as noted above.

The Student Outcomes for this course are:

• Describe the role of computer forensics professionals.

• Analyze hard disks and File System in Window and Linux OS.

• Perform data carving and steganography.

• Evaluate digital forensics tools for web browser, network, and email forensics.

• Recover passwords, analyze log data files, and create professional forensic reports

**Additional open source materials available to use:**

<https://www.educause.edu/> The EDUCAUSE is the website and public repository for the largest IT community of practice devoted to IT in support of higher education. The site curates crowd-sourced and crowd-peer-reviewed materials across the full range of topics covering management of IT for higher education under a Creative Commons Attribution-Share Alike Public License. An additional advantage for using EDUCAUSE.edu for an academic course is that our students have direct experience of all issues discussed, as they are enrolled in our university. KSU is a member of EDUCAUSE, which means that faculty can be authenticated for early access (prior to official publication date), but once the publication date has been reached, the material is available on the public website. EDUCAUSE.edu covers all learning outcomes for IT6853. In reviewing its prior use in our IT curriculum, accuracy and scope are at least 80%.

<https://www.wikipedia.org/> The Wikipedia website has a wide range of mostly acceptable articles and sub-portals covering the management of IT available under a Creative Commons Attribution-Share Alike Unported License. A distinct advantage is that technical language and IT jargon is reduced. Examples of clear communication with lay personnel is exceedingly important to success in managing IT. Wikipedia is most useful for learning outcomes 1, 2 and 3. In reviewing its prior use in our IT curriculum, accuracy and scope for Wikipedia are at least 70% and average around 85%. Past group projects in this and similar MSIT classes have corrected and/or enhanced Wikipedia articles covering IT issues.

**The following resources will be created during the project.**

1. A set of new learning materials including readings and links

2. Newly developed content material for the module

3. Customized content slides to provide OER instead of commercial book chapters and slides.

The faculty member will update the materials during the period in the following way:

(a) For each module, new slides and study guides with learning resources will be provided to the student; for example, in the module "Linux File System and Forensic Artifacts", interactive slides explaining the Hex Dump of the file system will be developed, so the student can analyze step by step of the forensic process and visualize the final data extraction of the file system information. (b) Each module will have one hands-on lab to evaluate and measure the learning outcome; for example, in the module "Network Forensics", the student will complete a NetLab+ lab that includes the use of different virtual machines (provided by the tool) and use commands for capturing and analyzing packets; all this without using external paid tools.

(c) Each module will incorporate a set of up-to-date papers as recommended readings with different case studies in computer forensics. For example, with the support of the KSU library, the faculty member will develop a "Computer Forensic Wiki". The Wiki will be a website with relevant information and links to new papers in the computer forensic field.

(d) Each module will include recording videos of the faculty member explaining the details of the most important parts of the topic. Besides lectures, the faculty will develop a set of small videos on computer forensics techniques to give the student precise and concise information about how to conduct determined investigations. For example, in the module "Data Acquisition", short videos about how to use different commands to create disk images in different operating systems will be provided, so the student can quickly refer to them when needed.

All modules with the new material will support one or more of the course learning outcomes. The subject matter expert/editor will ensure that every course learning outcome is supported by the learning material, and assessed through one of the chosen activities in the course – such as a hands-on lab, discussion or quiz/test.

The course has a total of 15 modules. To develop the materials, slides, hands-on lab structures, Wiki papers, videos, and added links, the faculty member estimates time of 2.5 weeks for each module, which represents approximately 38 weeks (this represents the 73% of the project time). Another 26% of the time will be used to improve, evaluate, and modify materials according to the college and other faculties' inputs. The aforementioned works match the budget of $5000 for developing this course. The budget will be invested in the faculty member that will develop the materials and the "Computer Forensics Wiki."

**Preliminary list of current no-cost resources that will support the re-developed as listed above:**

<https://en.wikipedia.org/wiki/Computer_forensics>

 **Computer forensics** (also known as **computer forensic science**[[1]](https://en.wikipedia.org/wiki/Computer_forensics#cite_note-noblett-1)) is a branch of [digital forensic science](https://en.wikipedia.org/wiki/Digital_forensics) pertaining to evidence found in computers and digital [storage media](https://en.wikipedia.org/wiki/Storage_media). The goal of computer forensics is to examine digital media in a forensically sound manner with the aim of identifying, preserving, recovering, analyzing and presenting facts and opinions about the digital information.

Although it is most often associated with the investigation of a wide variety of [computer crime](https://en.wikipedia.org/wiki/Computer_crime), computer forensics may also be used in civil proceedings. The discipline involves similar techniques and principles to [data recovery](https://en.wikipedia.org/wiki/Data_recovery), but with additional guidelines and practices designed to create a legal [audit trail](https://en.wikipedia.org/wiki/Audit_trail).

Evidence from computer forensics investigations is usually subjected to the same guidelines and practices of other digital evidence. It has been used in a number of high-profile cases and is becoming widely accepted as reliable within U.S. and European court systems.

<https://www.businessnewsdaily.com/10893-free-computer-forensics-training-resources.html>

##  **Computer Forensics Training Resources for IT Pros**

Although lots of free information security training is readily available, the same cannot be said for computer forensics — it's in high demand, but darned hard to come by. We sleuthed our way across the web to find the best options that are worth your time and attention. Some of the training mentioned in this article requires that you create an account and then sign up for a course, although other items are available directly on the websites listed.

<https://resources.infosecinstitute.com/category/computerforensics/introduction/areas-of-study/>

Computer forensics contains six primary areas for study. Each of them is significant and provides sufficient information to understand the scope of this subject. To become a forensics expert, the candidates must know these six study areas, which are described below. These include:

1. The Legal and Ethical Principles of Computer Forensics

2. Computer Forensics Investigations

3. Computer Forensics: Forensic Science

4. Digital Forensics

5. Application Forensics

6. Hybrid and Emerging Technologies

**Timeline with Activities:**

10/30/20 through 12/31/20-

IT6853-Task 1: Review of the current textbook’s topical chapters to the IT6853 Learning Outcomes plus additional topics needed to be included and mapped to the course’s learning outcomes. Begin collection of external “free” resources needed to support the learning outcomes of the course. This activity is expected to require 20 hours and is a part of ongoing course curriculum and improvement activities.

1/1/21 through 2/28/21-

IT6853-Task 2: Complete collection of external “free” resources for the course. Begin working on design and development of the new modules for the course. Decide how many modules the course will have and the template design each module will follow. This will include “look and feel” design of each module. This task is expected to require 30 hours.

3/1/21 through 5/31/21

IT6853-Task 3: Complete course modules. The is the actual creation of the new course material based upon the above activities and course outcomes. The includes ADA compliance for the course. This task is expected to require 80 hours as it will result in the “draft” of the completed course.

6/1/21 through 8/31/21-

IT6853-Task 4: The subject matter expert will evaluate the “draft” course modules, paying close attention to the attainment of course outcomes. The instructional designer will evaluate the course based upon navigation, “look and feel”, and ADA compliance. The student will go through the course navigation, look at numbers of assignments, discussions, tests/quizzes, etc., and evaluate it from a student perspective on being able to complete the course. Any corrections will be sent back to the faculty member to make. The SME’s activities are expected to be 45 hours in total. The Instructional Designer’s activities are expected to take approximately 30 hours in total. The student’s activities are to simulate “taking” the course by looking at content, all links, assignments, discussions, tests/quizzes, etc., and evaluate the course as the amount of work required and whether or not the course appears to meet the course outcomes. This will take approximately 200 hours in total for the student (20 hrs/wk for 10 weeks). The changes that may need to be made by the faculty member are assumed to take 30 hours in total.

9/1/21 through 12/31/21-

IT6853-Task5: Teach the course during fall 2021 semester. Implement the student assessment survey at the end of the course, and present the findings of the survey to the Project Director for inclusion into the final project report. Post the created IT6853 materials on the publishing website. The additional work above teaching the course will take 10 hours.

**IT 4853 Computer Forensics – Dr. Seyedamin Pouriyeh**

This course is taught regularly as part of the concentration area “IT Security” in the Bachelor of Science in Information Technology, College of Computing and Software Engineering, at Kennesaw State University. Usually at a minimum 4 sections of this course are offered each academic year. This concentration area requires 5 courses to complete. The course currently uses a textbook in the forensics area as noted above.

The Course Learning Outcomes are:

* Define and explain the role of digital forensics in the incident response and investigatory process.
* Identify the requirements for proper evidence collection, handling and storage.
* Identify and explain basic techniques to properly collect and analyze evidentiary data using appropriate tools and techniques in common scenarios.
* Organize and present evidentiary data and investigatory findings for use in corporate or legal proceedings.

The course will be redeveloped as a no-cost course with various changes to the contents of the course including:

1. The current version of the course is assessed based on 15 labs as well as 2 exams covering 80% and 20% of total grade respectively. The grading policy will be updated by adding two more graded assessments including a small research project and discussions. The recommended weights of those assessments are 15% and 5% of the final grade. This will make the grading structure as 5% discussions; 15% research project; 60% labs and 20% tests.
2. A new set of labs need to be designed and developed based on the publicly available material for each module. Instead of 15 labs, there will be 8 labs that have more in-depth expectations.
3. A discussion will be created for each module that will discuss the important topics of the module.
4. A recorded lecture will be created for each module that will discuss the concepts of the module.
5. New content will be created based upon the recorded lecture.
6. New power point slides will be created based upon the recorded lecture.
7. New links, including YouTubes and other videos, text links and guides will be included in each module to support the concepts of the module.
8. For more difficult topics – such as the Linux file system, or virtual machines, the faculty member will create additional mini-lectures on “how to” do the labs associated with the topics.

**Additional open source materials available to use:**

<https://www.educause.edu/> The EDUCAUSE is the website and public repository for the largest IT community of practice devoted to IT in support of higher education. The site curates crowd-sourced and crowd-peer-reviewed materials across the full range of topics covering management of IT for higher education under a Creative Commons Attribution-Share Alike Public License. An additional advantage for using EDUCAUSE.edu for an academic course is that our students have direct experience of all issues discussed, as they are enrolled in our university. KSU is a member of EDUCAUSE, which means that faculty can be authenticated for early access (prior to official publication date), but once the publication date has been reached, the material is available on the public website. EDUCAUSE.edu covers all learning outcomes for IT4853. In reviewing its prior use in our IT curriculum, accuracy and scope are at least 75%.

<https://www.wikipedia.org/> The Wikipedia website has a wide range of mostly acceptable articles and sub-portals covering the management of IT available under a Creative Commons Attribution-Share Alike Unported License. A distinct advantage is that technical language and IT jargon is reduced. Examples of clear communication with lay personnel is exceedingly important to success in managing IT. Wikipedia is most useful for learning outcomes 1, 2 and 3. In reviewing its prior use in our IT curriculum, accuracy and scope for Wikipedia are at least 80% and average around 85%. Past group projects in this and similar BSIT classes have corrected and/or enhanced Wikipedia articles covering IT issues.

**Preliminary list of current no-cost resources that will support the re-developed as listed above:**

<https://www.nist.gov/programs-projects/digital-forensics>

Digital evidence includes data on computers and mobile devices, including audio, video, and image files as well as software and hardware. Digital evidence can be part of investigating most crimes, since material relevant to the crime may be recorded in digital form. Methods for securely acquiring, storing, analyzing digital evidence quickly and efficiently are critical. ITL promotes the efficient and effective use of computer technology to investigate crimes.

<https://blog.eccouncil.org/what-does-a-digital-forensics-investigator-do-in-an-investigation/>

What Does a Digital Investigator Do in an Investigation? Digital forensics investigation is one of the leading disciplines developing from the extensive field of forensic science. Every organization with a working computer system needs the services of a qualified digital forensics analyst. However, in spite of the remarkable development in the digital world and the increase in cybersecurity attacks through digital tools and techniques, most forensic investigators lack the appropriate credentials to perform digital forensic investigations.

<https://en.wikipedia.org/wiki/Computer_forensics>

 **Computer forensics** (also known as **computer forensic science**[[1]](https://en.wikipedia.org/wiki/Computer_forensics#cite_note-noblett-1)) is a branch of [digital forensic science](https://en.wikipedia.org/wiki/Digital_forensics) pertaining to evidence found in computers and digital [storage media](https://en.wikipedia.org/wiki/Storage_media). The goal of computer forensics is to examine digital media in a forensically sound manner with the aim of identifying, preserving, recovering, analyzing and presenting facts and opinions about the digital information.

Although it is most often associated with the investigation of a wide variety of [computer crime](https://en.wikipedia.org/wiki/Computer_crime), computer forensics may also be used in civil proceedings. The discipline involves similar techniques and principles to [data recovery](https://en.wikipedia.org/wiki/Data_recovery), but with additional guidelines and practices designed to create a legal [audit trail](https://en.wikipedia.org/wiki/Audit_trail).

Evidence from computer forensics investigations is usually subjected to the same guidelines and practices of other digital evidence. It has been used in a number of high-profile cases and is becoming widely accepted as reliable within U.S. and European court systems.

<https://resources.infosecinstitute.com/category/computerforensics/introduction/areas-of-study/>

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1. The Legal and Ethical Principles of Computer Forensics

2. Computer Forensics Investigations

3. Computer Forensics: Forensic Science

4. Digital Forensics

5. Application Forensics

6. Hybrid and Emerging Technologies

**Timeline with Activities:**

10/30/20 through 12/31/20-

IT4853-Task 1: Review of the current textbook’s topical chapters to the IT4853 Learning Outcomes plus additional topics needed to be included and mapped to the course’s learning outcomes. Begin collection of external “free” resources needed to support the learning outcomes of the course. This activity is expected to require 20 hours and is a part of ongoing course curriculum and improvement activities.

1/1/21 through 2/28/21-

IT4853-Task 2: Complete collection of external “free” resources for the course. Begin working on design and development of the new modules for the course. Decide how many modules the course will have and the template design each module will follow. This will include “look and feel” design of each module. This task is expected to require 20 hours.

3/1/21 through 5/31/21

IT4853-Task 3: Complete course modules. The is the actual creation of the new course material based upon the above activities and course outcomes. The includes ADA compliance for the course. This task is expected to require 80 hours as it will result in the “draft” of the completed course.

6/1/21 through 8/31/21

IT4853-Task 4: The subject matter expert will evaluate the “draft” course modules, paying close attention to the attainment of course outcomes. The instructional designer will evaluate the course based upon navigation, “look and feel”, and ADA compliance. The student will go through the course navigation, look at numbers of assignments, discussions, tests/quizzes, etc., and evaluate it from a student perspective on being able to complete the course. Any corrections will be sent back to the faculty member to make. The SME’s activities are expected to be 45 hours in total. The Instructional Designer’s activities are expected to take approximately 30 hours in total. The student’s activities are to simulate “taking” the course by looking at content, all links, assignments, discussions, tests/quizzes, etc., and evaluate the course as the amount of work required and whether or not the course appears to meet the course outcomes. This will take approximately 200 hours in total for the student (20 hr/wk for 10 weeks). The changes that may need to be made by the faculty member are assumed to take 30 hours in total.

9/1/21 through 12/31/21

IT4853-Task5: Teach the course during fall 2021 semester. Implement the student assessment survey at the end of the course and present the findings of the survey to the Project Director for inclusion into the final project report. Post the created IT4853 materials on the publishing website. The additional work above teaching the course will take 10 hours.

**Description of other Team Member’s Activities:**

6/1/21 through 8/31/21

***Subject Matter Expert/Editor:*** This role will be to examine all three courses in the project for the proper content and supporting documentation that meet all course outcomes. This means checking out content, power point slides, and all external links to various types of supporting material. Additionally, all editing will be done for the course, with changes being made as needed. This is expected to take approximately 15 hours per course, or 45 hours in total. Any changes will be made by the course developer.

***Instructional Designer:*** This role will be to evaluate each course in the project for proper instructional design best practices. The ID will evaluate the navigation, “look and feel” across the course, and ADA compliance. Any changes will be sent to the faculty member to correct. This is expected to take approximately 15 hours per course, or 45 hours in total.

***Student***: This role will be to evaluate each course in the project by simulating “taking” the course. The student will examine all content, links, discussions, assignments/labs, tests/quizzes and evaluate that the course appears to meet course outcomes, and that the amount of material presented and the amount of work for the course is consistent with what is normally expected of students. Any suggested changes will be sent to the course developer for changes. This is expected to take approximately 20 hours per week for 10 weeks.

4. Quantitative and Qualitative Measures

Below are the listed the various quantitative and qualitative measures that are done for our continuous improvement – including the re-developed courses for the ALG proposal.

A. For each course in this project, a student survey will be given at the end of the course. This survey was developed two years ago to have consistent questions for students about using no-cost materials in the course. Questions include such things as:

1. Do you believe that you achieved the learning outcomes of the course with the no-cost materials provided?
2. Do you believe that each module contained sufficient material that allowed you to achieve the outcomes of the module?
3. Was the material in the course easy to navigate between modules?

Each survey responses are collected and analyzed by the course faculty/developer. Results of the survey are shared at the first IT meeting of spring 2021 and the annual assessment retreat during spring 2021.

No IRB approval is needed for this student survey as they are anonymous and within the course guidelines.

B. In addition, grades are compared for the no-cost re-developed section, and previous sections of the course that used a textbook. The results of the grade comparison are shared at the first IT meeting of spring 2021 and the annual assessment retreat during spring 2021.

C. The re-developed no-cost course retention rates will be compared with previous courses using the textbook. This comparison will be shared at the first IT meeting of spring 2021 and the annual assessment retreat during spring 2021.

D. The IT department collects an FCAR – Faculty Course Assessment Report at the end of each course taught throughout the year. This report gives statistics for the achievement of course outcomes, and also gives the faculty member space to analyze the results of outcomes achievement and suggest possible improvements for the course for the next time it is taught.

This FCAR is used for continuous improvement and is part of the Information Technology Department’s Continuous Improvement Plan. The FCARs are also used as documentation for our self-study for ABET accreditation for our BSIT program. The MSIT program does not have ABET accreditation.

E. The annual assessment meeting of the department takes place in the spring term, and each year new or updated courses, as well as 1/3 of the total number of courses in the degree are assessed for any improvements that need to be made. The FCARs are used to evaluate the success of meeting course and program outcomes. Each course has a faculty course coordinator that collects the information from the FCARs of the course from previous terms and makes suggestions for improvements to be made. Faculty in the department vote on these recommended changes, and all changes are implemented the next fall term. This is part of department Continuous Improvement Plan.

## 5. Timeline

Timeline for Project:

10/30/20 – 12/31/20: review external materials needed to support course outcomes

 Begin collection of these materials for each course by developers

1/1/21 – 2/28/21: Complete collection of all external resources for course

 Design # of modules to be used for the course by developers

 Design “template” of modules so they have the same material in the same

 Order by each developer for each separate course

3/1/21- 5/31/21: Develop all modules for the course. Each module includes external

 Material, and content and power points with sound; complete

 ADA requirements; labs, quizzes, assignments, tests, etc.

6/1/21 – 8/31/21: Subject matter expert/editor completes assessment of how well the

 Materials of the course support each course outcome and

 Module outcome

 Instructional Designer assesses course for consistent “look and feel”,

 Navigation, and ADA requirements

 Student assesses the ease of navigation throughout the course, looks

 At total number of discussions, labs, readings, tests/quizzes to

 See if students are able to complete the course in a reasonable

 Manner

9/1/21 – 12/31/21: Teach the course fall term 2021

 Give student survey at the end of the course

 Collect and analyze results of the survey

 Post all learning materials from the course in proper location

1/1/22 – 1/15/22: Write Final Report for the grant and submit on, or before, the due date

## 6. Budget

The Budget for this project includes full course development payments to three faculty, payment for the instructional designer, payment for the student, and payment for the Quality Assurance Subject Matter Expert/Editor.

* Payment for development of all course materials for IT 6853 Computer Forensics – Dr. Maria Valero $5,000
* Payment for development of all course materials for IT 6683 Management of IT – Dr. Richard Halstead-Nussloch $5,000
* Payment for development of all course materials for IT 4853 Computer Forensics – Dr. Seyedamin Pouriyeh $5,000
* Payment for Instructional Designer $3,000
* Payment for Student $2,000
* Payment for Quality Assurance/Editor $4,000

## 7. Sustainability Plan

Maintenance and Updating of Course Materials:

The courses developed for the proposed grant will follow the continuous improvement Plan as outlines above:

A. The IT department collects an FCAR – Faculty Course Assessment Report at the end of each course taught throughout the year. This report gives statistics for the achievement of course outcomes, and also gives the faculty member space to analyze the results of outcomes achievement and suggest possible improvements for the course for the next time it is taught.

This FCAR is used for continuous improvement and is part of the Information Technology Department’s Continuous Improvement Plan. The FCARs are also used as documentation for our self-study for ABET accreditation for our BSIT program. The MSIT program does not have ABET accreditation.

B. Each course is assigned a course coordinator who creates a “template shell” of the complete course. Each faculty who teaches the course copies this template into their current term course. This is done to keep the consistence of each course. The course coordinator is also the one who presents any improvements that should be made to the course at the annual assessment meeting.

C. The annual assessment meeting of the department takes place in the spring term, and each year new or updated courses, as well as 1/3 of the total number of courses in the degree are assessed for any improvements that need to be made. The FCARs are used to evaluate the success of meeting course and program outcomes. Each course has a faculty course coordinator that collects the information from the FCARs of the course from previous terms and makes suggestions for improvements to be made. Faculty in the department vote on these recommended changes, and all changes are implemented the next fall term. This insures that each course is completely evaluated at a minimum of every 3 years in the improvement cycle. New or re-developed courses are done at the first annual assessment meeting after they were taught the first time, and again during the 3rd year. This is part of department Continuous Improvement Plan.

**Commitment of the Department, Dean and Provost:**

Both the Dean of the College of Computing and Software Engineering, and the Provost of the University have been giving ongoing support to create “no-cost” or “low-cost” materials. They both have been very supportive (letters, etc.) with the efforts of the Information Technology Department to create both the BSIT and MSIT degrees as “Z” degrees – “no cost” materials. This will allow the department to continue the efforts supported from the ALG grants going forward using our Continuous Improvement Plan.

The Information Technology Department ONLY uses the “no-cost” version of any course that has been developed in this modality. Students have been very pleased with the courses that have been previously developed.

**Possible Expansions:**

The MSIT degree program is currently undergoing a revision to it’s curriculum by adding some new, current courses. If the ALG grant projects are still being offered, we will be proposing adding these new courses to the “no-cost” endeavors. The “no-cost” materials are the ones that support the Information Technology degrees, because textbooks in our discipline are notoriously “out-of-date” at the time of publication. The ability to create our courses using the most up-to-date materials allows us to better meet the course outcomes, and better prepare our students for jobs in the workplace.

# 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.*

I agree to this project being 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)*.*

I agree to the Accessibility Terms.

# 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.*

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| Dr. Jon Preston, Dean College of Computing and Software Engineering |

# 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.*

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| Kim Hunt, Grants Office KSU |