**Affordable Learning Georgia Affordable Materials Grants
Continuous Improvement Grants Final Report**

*(or Mini-Grants, for R17 and earlier)*

# General Information

Date: 12/13/2024

Grant Round: R24

Grant Number: M240

Institution Name(s): Kennesaw State University

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

|  |  |  |
| --- | --- | --- |
| Team member | Name | Email address |
| Team member 1 | Shirley Tian | xtian2@kennesaw.edu |
| Team member 2 | Chole Xie | yxie11@kennesaw.edu |
| Team member 3 | Nazmus Sakib | nsakib1@kennesaw.edu |
| Team member 4 | Liang Zhao | lzhao10@kennesaw.edu |
| Team member 5 | Linh Le | lle13@kennesaw.edu |

Project Lead: Shirley Tian

Course Name(s) and Course Numbers:

IT 5413 Software Design and Development
IT 6423 IT System Acq & Integration
IT 7333 Enterprise Cloud and Wireless Security
IT 7133 Enterprise AI Applications

Final Semester of Project:

2024 Fall

***If applicable to your project:***

Average Number of Students Per Course Section: 25

Number of Course Sections Affected by Implementation of Revised Resources: 6

Total Number of Students Affected by Implementation of Revised Resources: 150

# Project Narrative

*Describe the course of your revision or ancillary creation project, including*

* *A summary of your project’s purpose, plan, and timeline.*
* *The original works which were revised or added to, with links. For example, if you revised an open textbook, give the title, author, and link.*
* *A narrative description of how the project’s plan was carried out.*
* *Lessons learned, including anything you would do differently next time.*

The Department of Information Technology at Kennesaw State University (KSU) has made department-wide efforts to adopt open educational resources (OER) in both undergraduate and graduate courses and housing both Z-Degrees since 2020. Thanks to strong support from Affordable Learning Georgia (ALG), all the courses from the MSIT program have now replaced their textbooks with no-cost-to-student OER learning materials. Information technology is an ever-changing field; it is very important to keep our courses updated. The degree program periodically undergoes curriculum revision every three years. Out of this, we are planning to update four courses. Most of them were updated more than two years ago and needed to be aligned with current industry best practices and trends as follows:

IT 5413 Software Design and Development
IT 6423 IT System Acq & Integration
IT 7333 Enterprise Cloud and Wireless Security
IT 7133 Enterprise AI Applications

As part of our department ALG strategic plan, we propose to create OER materials for these four courses to keep up the MSIT Z-Degree. Our assigned faculty to develop these courses have already identified the preliminary sources based on the learning objectives for developing OER materials. We are striving to make OER resources accessible to all students, as a result, further effort is needed to make developed slides, lectures, test questions compliant with accessibility criteria enforced by Digital Learning Innovation at KSU. The overall goals of our project are listed as follows. The specific plan about each individual course is illustrated in the action plan section.

* Develop new OER materials for courses to be part of MSIT Z Degree
* Ensure all developed OER materials are free from any accessibility issues.
* Develop new OER materials based on course learning outcomes.
* Develop new ancillary material such as assignments and lab material.
* Use a department provided layout template to make sure OER material in each course has similar look and feel.
* Ensure all course materials including lectures, slides, resources comply with the specific accessibility standards defined by ALG.

Create a course package that can be imported into D2L Brightspace, the course management system used by the University System of Georgia.

# Materials Description

*Describe all the materials you have created or revised as part of this project. These descriptions may be used in the* [OpenALG](https://alg.manifoldapp.org/) *repository description field. Include the* [*open license your materials will be shared under*](https://creativecommons.org/share-your-work/)*—for most materials, this will be an Attribution 4.0 License (CC BY) as required in the Grants Request for Proposals.*

IT 5413 Software Design and Development
Faculty developer – Dr. Chole Xie.

This course is designed for graduate students in Information Technology with limited knowledge of software development and programming. It covers the fundamentals of software design and development, basic Python programming, and related research writing skills. The purpose of IT5413 is to enhance students’ understanding of software development and basic Python programming strategies, as well as writing techniques so that they are prepared and ready for future challenges and advanced courses in the IT program. To improve this course and keep it update-to-date, we propose the following changes and updates:

* Replace time-sensitive materials, including up-to-date the most popular software as samples to introduce
* Update study materials to suit the most recent version of Python
* Add a new module for software design case study
* Add a new module for software cloud development
* Update the term project requirements, to encourage students to present their Software Design ideas and algorithms instead of research papers only

Dr. Chloe Xie will revise the course materials based on the above proposed changes. She will also improve the course structures, including modules, assignments, term projects, deliveries, etc. Besides, she will also update the course slides and presentations. The estimated time working on this course will be 50 hours.

IT 6423 IT System Acq & Integration
IT System Acquisition & Integration is a course designed to provide IT students with valuable knowledge and skills for acquiring, integrating, and managing information systems. As technology continues to evolve, there is a growing demand for IT professionals who can master the complexities of integrating new features with existing ones. This course offers students an in-depth understanding of various IT acquisition strategies, project management, system development methodologies, risk analysis techniques, and effective communication skills. Through intensive coursework, hands-on projects, and real-world simulations, students develop the ability to design, acquire, and integrate complex systems while adhering to industry-standard practices and regulations. With its emphasis on critical thinking, problem-solving, and teamwork, this course prepares students to meet the demands of today's fast-paced IT industry and hone essential learning outcomes for success in their future careers. We propose the following update to the course.

* Improve the readability, interpretability, and accessibility of Module 1 & 2.
* Expand Module 3 to include cutting-edge technologies and best practices in system acquisition and integration.
* Increase the emphasis on communication skills, such as public speaking, interpersonal interaction, and report writing, through group presentation events.
* Incorporate group research activities toward preparing RFP on solving a pressing research challenge of this era.
* Increase the use of hands-on activities to reinforce learning concepts.
* Introduce advanced topics, such as Artificial Intelligence (AI) and Machine Learning (ML), at a high level to incorporate in system acquisition.

Dr. Nazmus Sakib will enhance the course website by adding new no-cost and accessibility-compliant OER materials. These materials will reflect the changes made to the learning modules. Dr. Sakib will also create study guides, notes, assignments, lab exercises, projects, and presentation slides for each module.

IT 7333 Enterpise Cloud and Wireless Security

Faculty developer – Dr. Liang Zhao.

This course is an advanced study and analysis of the concepts, methodologies, and technologies in securing enterprise cloud and wireless networks. Topics include but are not limited to wireless network protocols, wireless LAN security tools, cloud computing infrastructure, the evolution of the cloud, confidentiality and integrity of the cloud, and current trends in cloud and wireless security. We propose to update the no-cost OER by incorporating up-to-date knowledge on cloud and wireless security as follows.

* + Update the materials and modules for accessibility.
	+ Revise module 2 to add more learning material about cybersecurity frameworks, including NIST.
	+ Revise module 3 to add learning material on WiFi 6 protocol and hands-on instructions on wireless network administration.
	+ Revise module 6 to add hands-on instruction on using Wireshark for wireless network analysis.
	+ Revise module 9 to add learning material about cloud storage. AWS S3 service will be adopted as an example in the learning material to show the security features implemented for cloud storage. In addition, add learning material about cloud computing. AWS EC2 will be adopted to demonstrate the concept. Hands-on instruction on using and managing EC2 will be developed and added.
	+ Revise modules 10, 11, and 12 to add learning material on Identity and access management (IAM), policies, and its related services on the cloud. AWS will be adopted as an example in the learning material. Hands-on instruction on the IAM configuration and administration will be developed and added.

Dr. Liang Zhao will update the public website of this course by incorporating the new no-cost and accessibility-compliant OER materials that reflect the described changes for the relevant learning modules. In addition, he will develop study guides and notes for each module and create ancillary material as appropriate, such as assignments, lab exercises, projects, and presentation slides.

IT 7133 Enterprise AI Applications

Faculty developer – Dr. Linh Le.

Enterprise IT processes massive data acquired from servers, operating systems, applications, and users. Artificial Intelligence (AI) can be used to analyze these data with the aim of significantly improving IT operations. This course covers a variety of AI techniques that can be applied to IT. Students will learn practical skills in developing intelligent IT applications. Due to the fast pace of changes in IT and AI, certain topics and technologies introduced in this course have become outdated and inapplicable. Furthermore, the AI tools that are utilized for hands-on practices are from old software or were installed in outdated infrastructures and are not usable at this moment. Lastly, one major AI platform used in this course, Microsoft Azure, has been reported to initiate unwanted charges to students. Overall, we propose to update the course in both contents and tools that will be taught. The materials will be reorganized and updated as follows:

* Update all modules to include a study guide, a lecture slide discussing the new technologies as well as hands-on examples.
* Migrate all hands-on practices and assignments to free cloud services such as Python and Google Collaboratory.
* Expand the enterprise applications to include:
	+ Regression/Classification on tabular data
	+ Image classification and object detection
	+ Regression/Classification on text data
	+ Text summarization and text paraphrasing
	+ Multi-model AI on text to image and vice versa
	+ Building frontend applications

Dr. Linh Le will oversee updating this course. All materials will be aggregated from public articles and open-source software/libraries.

# Materials Links

*If you are hosting your materials in places other than OpenALG, please provide these links in this section. Otherwise, leave blank. Note: we cannot access D2L or Canvas links.*

* IT 5413 Software Design and Development
* IT 6423 IT System Acq & Integration
* IT 7333 Enterprise Cloud and Wireless Security
* IT 7133 Enterprise AI Applications

[***https://www.dropbox.com/s/si41h70hw0kt8qs/OneDrive\_1\_12-13-2024.zip?dl=0***](https://www.dropbox.com/s/si41h70hw0kt8qs/OneDrive_1_12-13-2024.zip?dl=0)

# Future Plans

* *Describe any planned or actual papers, presentations, publications, or other professional activities that you expect to produce that reflect your work on this project.*
* *Describe any plans to revise or add to these materials in the future.*

This project will be used to conduct further research on the ALG Round research project.

We plan to revise and revisit the course materials after 2-3 years.