**Affordable Learning Georgia Textbook Transformation Grants**

**Final Report for Mini-Grants**

# General Information

Date: May 13th, 2020

Grant Round: 13

Grant Number: M71

Institution Name(s): Augusta University

Team Members (Name, Title, Department, Institutions if different, and email address for each): Clément Aubert, PhD, School of Computer and Cyber Sciences, caubert@augusta.edu

Project Lead: Clément Aubert

Course Name(s) and Course Numbers: CSCI 3410 - Database Systems

Final Semester of Project: Spring 2020

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

Average Number of Students Per Course Section: 16.8

Number of Course Sections Affected by Implementation of Revised Resources: 1

Total Number of Students Affected by Implementation of Revised Resources: 35 over the year.

# Project Narrative

My goal was to deliver a cross-platform, all-in-one resource on database systems for undergraduate, enthusiast high-school students, and students in continuous training.

The same document has been shared in three versions and contain:

- A large collection of exercises, exams, problems, as well as selected solutions,

- A "hands-on" guide to install, configure and run various database management systems,

- A compact guide to the most fundamental definitions and notions of the topic at stake,

- Organized and up-to-date references.

Timeline:

- Spring 2019: Polishing, testing and assessing the bank of problems, questions and tutorials.

- Summer 2019: Writing of additional material on security and professional responsibilities.

- Fall 2019: Implementing the modifications suggested during the previous semesters, enhanced and completed the narrative, updated the references and links to external resources.

- Spring 2020: Hiring of a student assistant (Crystal Anderson) to proof-read, test and comment on the current draft throughout. The student had ~60 hours to revise the material and discuss it with me. A team of three students improve the documentation and portability of the notes during a Capstone Project that I supervised.

The lecture notes developed from scratch are at

http://spots.augusta.edu/caubert/db/ln/

The plan was carried out mostly as planned, and was not really impacted by Covid-19, as most of the work was already done by the time USG recommended to shift to distant learning. Developing the narrative took longer than I thought, but checking the problems and solutions was a task that Crystal successfully carried on, which made it easier for myself to focus on it. Having one of the group in the software engineering class working on my project helped making it more accessible, and better documented. This should facilitate re-use and external contributions.

I spent a lot of time “fine-tuning” the way the documents were produced, but I believe this engineering will help me greatly in tweaking the notes easily, and makes it easy for the students to work with them. I may try to find better way to engage the students in the future: simply relying on their interest for the class was not enough, and even if they had good ideas, they would only mention them passing by if I was explicitly asking. A better stream of feedback / integration should have been designed from the beginning.

# Materials Description

The *Database Systems Lecture Notes* are a comprehensive ±280 pages document that covers everything an undergraduate computer-science major needs to design, implement, asses, test and manipulate databases in a secure way. It also sketch the first steps toward the implementation of database applications, and discuss the relational as well as the non-relational approaches.

Those notes also contain:

- Over 60 problems, the majority of which have their solution detailed,

- Over 150 exercises, with complete solutions,

- Exams yearbooks from Fall 2017 to Spring 2020,

- Over 120 figures and sketches to illustrate and clarify the entity-relationship models, functional dependencies, the relational model, etc.

- Clear instructions to configure and set-up a working environment for MySQL, MariaDB, MongoDB and Java,

- A complete and updated list of references, including other open-source textbooks.

# Materials Links

The material is hosted at:

- <http://spots.augusta.edu/caubert/db/ln/> (“compiled” versions)

- <https://rocketgit.com/user/caubert/CSCI_3410> (source code)

The material was shared in three formats (html, pdf, odt), to make it as accessible as possible to the students. “Readily” versions are available at

<http://spots.augusta.edu/caubert/db/ln/CSCI_3410_lecture_notes.pdf>   
<http://spots.augusta.edu/caubert/db/ln/CSCI_3410_lecture_notes.html>  
<http://spots.augusta.edu/caubert/db/ln/CSCI_3410_lecture_notes.odt>

# Future Plans

Those notes will be updated as long as I teach this class, and I will continue to add the exam yearbook and solutions to the new problems. The references and links will regularly be updated, and the possible errors corrected. I will also edit the document to be more amenable to distant and on-site learning at the same time.

I will advertise and publicize this work, in the hope that colleagues will be able to re-use it, and to contribute to it. I will continue to contribute to the open-access, open-source platform <https://dba.stackexchange.com/> and to promote this work there. I will also reach out directly to instructors in Georgia teaching database classes to see if they would have an interest in using this tool.