Affordable Learning Georgia Affordable Materials Grants  
Transformation Grants Final Report

*(or Textbook Transformation Grants, if R17 or earlier)*

Once you have completed this template, to submit your Final Report, go to the [Final Report submission](https://survey.zohopublic.com/zs/xTCCvG) form.

The final report submission form allows you to submit the following:

* This completed narrative document (required)
* Syllabus or syllabi (required)

*If multiple files, compress into one .zip folder*

* Qualitative/Quantitative Measures data files (optional, as needed)

*If multiple files, compress into one .zip folder*

* Photo of your team or a class of your students for future ALG promotions (optional)
* Invoice for the second half of the grant’s award amount (optional)

Follow the instructions on the webpage for uploading your documents. Based on receipt of this report, ALG will process the final payment for your grant. ALG will follow up in the future with post-project grantee surveys and may also request your participation in a publication, presentation, or other event.

# General Information

**Date: 12/15/2024**

**Grant Round: Round 24**

**Grant Number: 677**

**Institution Name(s): Georgia Gwinnett College**

**Project Lead: Dr. Umar Khokhar**

**Team Members (Name, Title, Department, Institutions if different, and email address for each): Dr. Binh Tran, Associate Professor of Information Technology**

**Course Name(s) and Course Numbers: ITEC 3100 - Networking**

**Semester Project Began: Spring 2024**

**Final Semester of Implementation: Fall 2024**

**Total Number of Students Affected During Project: ~125 per semester**

# Narrative

* 1. *Describe the key outcomes, whether positive, negative, or interesting, of your project. Include:*

The development of the **networking textbook for ITEC 3100** has been a transformative and rewarding experience, both for me as an instructor and for my students. While it brought challenges, it also resulted in significant accomplishments that have positively impacted instruction and learning outcomes.

The textbook has reshaped how I teach networking concepts in ITEC 3100. Previously, I relied on a mix of fragmented resources, which often lacked coherence and accessibility. Now, with this unified and structured textbook, my instruction feels more streamlined and student-centered. The material flows logically from foundational concepts to advanced topics, ensuring that students build confidence as they progress.

Moreover, I was able to integrate **active learning strategies** into the book—such as practice problems, real-world scenarios, and hands-on exercises—that align seamlessly with my lectures. This has allowed me to shift from lecture-heavy classes to a more **interactive and engaging learning environment**.

* 1. *Describe lessons learned, including any things you would do differently next time.*

This project taught me valuable lessons that will guide future efforts:

1. **Balancing Depth and Simplicity**: I learned to prioritize clarity by breaking down complex topics like **IP addressing** into smaller, digestible sections, making them more accessible to students.
2. **Incorporating Student Feedback**: Early feedback was invaluable. Next time, I’ll involve students sooner to refine content iteratively and improve clarity.
3. **Time Management**: Writing a textbook was more time-intensive than anticipated. In the future, I’ll set realistic milestones and manage the process more efficiently.
   1. *Describe any materials you created or revised/remixed that will be shared with the public. 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.*

As part of this project, we have developed a **networking textbook** for ITEC 3100, providing a comprehensive introduction to networking concepts. The textbook includes the following chapters:

1. **Introduction to Networks**
   * Basics of networks, types, computer components, and communication models.
2. **Networking Devices**
   * Working, pros/cons, and limitations of devices such as repeaters, hubs, switches, routers, NICs, and WAPs.
3. **Network Topologies and Technologies**
   * Network design (LAN and WAN) and LAN implementation technologies.
4. **IP Addressing**
   * IPv4 and IPv6 structures, NAT vs. PAT, and LAN/WAN implementation.
5. **TCP/IP Protocol**
   * Layered architecture, TCP vs. UDP, and network protocol applications.
6. **OSI Model**
   * Layer functionalities, DHCP, and DNS configurations.
7. **Subnetting**
   * The need for subnetting and designing various subnet types.
8. **Network Operating Systems**
   * OS components, kernels, file systems, and client vs. server operating systems.

This textbook will be publicly shared under the **Attribution 4.0 International License (CC BY)**, allowing others to use, adapt, and share the material with proper attribution. By offering this resource openly, we aim to promote accessible and affordable learning for educators and students in the field of networking.

# Quotes

1. “The free materials were very detailed and thoroughly helped me with successful completion of the course”
2. “I am pleased with the quality of the no-cost eTextbook which was very informative and covered the course objectives”
3. “The free textbook allowed me to focus on the most important concepts needed for the course”

# Quantitative and Qualitative Measures

## Uniform Measurements Questions

*The following are uniform questions asked to all grant teams. Please answer these to the best of your knowledge.*

**Student Opinion of Materials - 78 responses**

**Was the overall student opinion about the materials used in the course positive, neutral, or negative?**

Total number of students affected in this project: \_\_\_125\_\_\_\_\_\_\_

* Positive: \_\_92.3\_(72)\_\_\_\_ % of \_\_\_78\_\_\_\_\_ number of respondents
* Neutral: \_\_5.1%\_(4)\_\_\_\_ % of \_\_\_78\_\_\_\_\_ number of respondents
* Negative: \_\_2.6%\_(2)\_\_\_\_ % of \_\_\_78\_\_\_\_\_ number of respondents

**Student Learning Outcomes and Grades**

**Was the overall comparative impact on student performance in terms of learning outcomes and grades in the semester(s) of implementation over previous semesters positive, neutral, or negative?**

*Student outcomes should be described in detail in Section 3b.*

Choose One:

* \_\_\_ Positive: Higher performance outcomes measured over previous semester(s)
* \_X\_\_ Neutral: Same performance outcomes over previous semester(s)
* \_\_\_ Negative: Lower performance outcomes over previous semester(s)

**Student Drop/Fail/Withdraw (DFW) Rates**

**Was the overall comparative impact on Drop/Fail/Withdraw (DFW) rates in the semester(s) of implementation over previous semesters positive, neutral, or negative?**

*Depending on what you and your institution can measure, this may also be known as a drop/failure rate or a withdraw/failure rate.*

\_\_\_12 (15)\_\_\_\_% of students, out of a total \_\_125\_\_\_\_\_ students affected, dropped/failed/withdrew from the course in the final semester of implementation.

Choose One:

* \_X\_\_ Positive: This is a lower percentage of students with D/F/W than previous semester(s)
* \_\_\_ Neutral: This is the same percentage of students with D/F/W than previous semester(s)
* \_\_\_ Negative: This is a higher percentage of students with D/F/W than previous semester(s)

## Measures Narrative

The textbook transformation for **ITEC 3100** has significantly improved student success and performance:

1. **Certification Success**:
   * On Average out of 24 students, **20 successfully passed the Certiport ITS Networking Specialist exam**, reflecting a **92% success rate**.
2. **Grade Distribution**:
   * On average, in a class of 28 students:
     + **14 earned A grades**, **6 earned B grades**, and **7 earned C grades**, with only **1–2 students receiving D or F grades**.

# Sustainability Plan

*We will review and update the materials from time to time accordingly to any course objective updates*

# Future Affordable Materials Plans

*This project has given the members more ideas for future ALG project proposals for other course ITEC courses.*

# Future Scholarship Plans

*The project members have considered doing a project presentation at a conference in the near future regarding the results of the ALG project and its positive impacts.*

# Description of Photograph (optional)



**Left: Dr. Umar Khokhar**

**Right: Dr. Binh Tran**