

# Cybersecurity Engineering, Cert. (GR)

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## Program Description

The certificate in Cybersecurity Engineering provides graduate students with the core concepts, tools and skills in cybersecurity engineering with the knowledge they need to maintain a safe, technologically-enhanced environment. These skills are essential for the design, integration, operation, and maintenance of large-scale systems in the government, military, and civil industries. The cybersecurity engineering discipline is focused on the successful realization and protection of large-scale, interconnected systems. The scope of cybersecurity engineering spans the entire system lifecycle, from earliest conception through system retirement.

## Outcome – Depth of Knowledge

Graduate students will be able to describe the fundamentals of cybersecurity and cyberoperations, and to describe its importance to national security.

### Measure – CYBR 602/CSCE 702 Course Semester Paper

**Data Collection:** CSCE 702/CYBR 602-Cybersecurity Law & Policy is a popular course offered every year for the graduate Cybersecurity Engineering Certificate. The course includes current events discussion on relevant information and relies on extensive analysis of laws and policies whereby students will demonstrate their knowledge and skills by preparing short written assignments throughout the semester on some aspect of cybersecurity law using their knowledge and skills obtained through the course. Students take a required midterm exam and an optional final to test their analytical skills on aspects of law such as legal issues surrounding emerging technologies that may compromise privacy.

At the end of the term, a semester paper is due on a topic of the student's choice approved by the instructor with some nexus to cybersecurity and law. The final exam is optional only if the student produces a semester paper with additional requirements (e.g., longer page length) than the normal paper rubric. In this paper, the students will demonstrate their knowledge of the fundamentals of cybersecurity and cyberoperations, explain legal implications, and relate its importance to national security or policy. Papers are gathered at the end of the term by instructional faculty for assessment.

**Methodology or data analysis strategy:** The instructor has offered students the option to not take the final exam. The semester grade is calculated using the relative percentages of all work and turning in a longer semester paper at an earlier due date (to give the instructor time to calculate the grades enabling students to make an intelligent decision whether to take the finals). The rubric for the semester paper is attached.

[See Cybersecurity Law Paper Rubric under *Supporting Documentation*.]

### Target

90% of students will have scores be at least 80% out of 100%.

## Supporting Documentation

**Measure:** CYBR 602/CSCE 702 Course Semester Paper

### Cybersecurity Law Paper Rubric

|                            |  |  |
|----------------------------|--|--|
| <b>20% of total points</b> | <p><b>Idea selection and explanation:</b><br/>         Did you come up with a good idea relative to this course?<br/>         Did you tie that idea to the content of this course?<br/>         Did you adequately explain the importance of the problem/issue?</p>  | <p>18 – 20% of total pts: Selected idea exceeds expectations.</p> <p>15% – 17% of total pts: Selected idea meets expectations.</p> <p>10% - 14% of total pts: Selected idea is not clearly linked to course.</p> <p>5% - 9% of total pts: Selected idea is weakly linked to course and will undermine other evaluation factors, notably Research and Analysis.</p> <p>1% - 4% of total pts: Selected idea is not acceptable.</p>   |
| <b>20% of total points</b> | <p><b>Research process:</b><br/>         Did you do good research from valid sources to investigate your idea?<br/>         Did you clearly communicate that research in the paper?<br/>         Do you have the correct number of required valid references?</p>  | <p>18 – 20% of total pts: Research as described exceeds expectations.</p> <p>15% – 17% of total pts: Research as described meets expectations.</p> <p>10% - 14% of total pts: Research is not clearly communicated or there is a lack of required valid references (missing no more than 3 valid references).</p> <p>5% - 9% of total pts: Research is weak and will undermine other evaluation factors, notably Analysis or there is a significant lack of required valid references (missing more than 3 valid references).</p> <p>1% - 4% of total pts: Research is not acceptable. References are not valid.</p> |
| <b>20% of total points</b> | <p><b>Analysis:</b><br/>         Did you analyze your research and draw conclusions based on your research?<br/>         Did you apply analytical skills to tie that analysis to course knowledge to demonstrate what you learned from this course.<br/>         Is your analysis clearly communicated in the paper?</p> | <p>18 – 20% of total pts: Analysis of research as described exceeds expectations.</p> <p>15% – 17% of total pts: Analysis of research as described meets expectations.</p> <p>10% - 14% of total pts: Analysis may be <u>adequate, but</u> is not clearly communicated and tied to research.</p> <p>5% - 9% of total pts: Analysis is weak and not tied to research.</p> <p>1% - 4% of total pts: Analysis is not acceptable.</p>  |

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|-----------------------------------|---|--|
| <p><b>20% of total points</b></p> | <p><b>Presentation:</b><br/>         Did you properly format your paper according to the requirements?<br/>         Did you use proper grammar, correct spelling, proper capitalization (e.g., Congress referring to the United States Congress is always capitalized as is the First Amendment as proper nouns.)<br/>         Does your paper look professional?</p> | <p>18 – 20% of total pts: Presentation of content exceeds expectations and is properly formatted and follows rules for proper grammar and spelling.</p> <p>15% – 17% of total pts: Presentation of content meets expectations with some minor errors in grammar, spelling, or capitalization.</p> <p>10% - 14% of total pts: Presentation of content is not clearly communicated.</p> <p>5% - 9% of total pts: Presentation of content has some serious issues with grammar, spelling, capitalization, etc.</p> <p>1% - 4% of total pts: Presentation of content is not acceptable with major problems with grammar, spelling, capitalization, etc.</p>            |
| <p><b>20% of total points</b></p> | <p><b>Writing Style:</b><br/>         How well does your paper read?<br/>         How well do you organize your ideas?<br/>         Is the paper substantial and would be of interest for other students in the class?</p>  | <p>18 – 20% of total pts: The paper is informative and exceeds expectations in terms of clarity and presenting the ideas, research, and analysis.</p> <p>15% – 17% of total pts: The paper is informative and meets expectations in terms of clarity and presenting the ideas, research, and analysis.</p> <p>10% - 14% of total pts: The paper has not clearly communicated the idea, research, and analysis.</p> <p>5% - 9% of total pts: The paper is difficult to read and understand the idea, research, and analysis.</p> <p>1% - 4% of total pts: The paper is unacceptable and fails to present the idea, research, and analysis in a coherent manner.</p> |