

**Credit Hours:** 3

**Contact Hours:** This is a 3-credit course, offered in accelerated format. This means that 16 weeks of material is covered in 8 weeks. The exact number of hours per week that you can expect to spend on each course will vary based upon the weekly coursework, as well as your study style and preferences. You should plan to spend 14-20 hours per week in each course reading material, interacting on the discussion boards, writing papers, completing projects, and doing research.

**Faculty Information:** Faculty contact information and office hours can be found on the faculty profile page.

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**COURSE DESCRIPTION AND OUTCOMES**

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**Course Description:**

This course provides a high-level understanding of critical infrastructures and key resources. Topics include the critical infrastructure protection process and an examination of its components: people, physical entities, and information systems. This course places CIKR in the context of the nation's overarching National Infrastructure Protection Plan (NIPP) and examines the interchange required for an integrated program. Further, it addresses the risk-informed resource allocation process as a key resource prioritization component.

**Course Overview:**

News reports nightly address the nation's infrastructure needs. Time and time again, we are reminded of the serious assessment required, and significant repairs needed, for the nation's critical infrastructure system to be maintained and kept operational. Keeping the national infrastructure system running smoothly, and without interruption, is no small feat! Often, we hear about the critical infrastructure of the United States and the challenges that it faces, but what does that term "infrastructure" really mean?

The very concept of infrastructure itself represents the underlying structure or framework in an organization or a system. Physical infrastructure examples would of course include roads, bridges, airports, and the like. Given today's wired nature of our economic and societal systems, cyberinfrastructure is an important focus of this course as well. As the old teaching goes, do not build your house on a foundation of sand. That old teaching rings true throughout the infrastructure lessons learned in this course. After this course, you will have a strong grasp on the infrastructure needs of the nation and infrastructure-related public policy solutions.

**Course Learning Outcomes:**

1. Asses the evolution and principles of critical infrastructure.
2. Describe critical infrastructures and key resources using risk based analysis
3. Apply infrastructure protection missions to various resources and activities.

4. Apply appropriate counter measure procedures as part of the CIKR protection plan using risk-based methodologies. Analyze key federal, state, local, and private agency contributions to infrastructure protection.
5. Evaluate the resource allocation process as a key function in distributing high-demand resources to the appropriate locations.

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## **PARTICIPATION & ATTENDANCE**

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Prompt and consistent attendance in your online courses is essential for your success at CSU-Global Campus. Failure to verify your attendance within the first 7 days of this course may result in your withdrawal. If for some reason you would like to drop a course, please contact your advisor.

Online classes have deadlines, assignments, and participation requirements just like on-campus classes. Budget your time carefully and keep an open line of communication with your instructor. If you are having technical problems, problems with your assignments, or other problems that are impeding your progress, let your instructor know as soon as possible.

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## **COURSE MATERIALS**

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### **Required:**

Rice, Mason & Sheno, Sujeet (2016) *Critical Infrastructure Protection X: 10th IFIP WG 11.10 International Conference, ICCIP 2016, Arlington, VA, USA, March 14-16, 2016, Revised Selected Papers*. Springer International Publishing ISBN 9783319487373

**NOTE:** All non-textbook required readings and materials necessary to complete assignments, discussions, and/or supplemental or required exercises are provided within the course itself. Please read through each course module carefully.

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## **COURSE SCHEDULE**

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### **Due Dates**

The Academic Week at CSU-Global begins on Monday and ends the following Sunday.

- **Discussion Boards:** The original post must be completed by Thursday at 11:59 p.m. MT and Peer Responses posted by Sunday 11:59 p.m. MT. Late posts may not be awarded points.
- **Opening Exercises:** Take the opening exercise before reading each week's content to see which areas you will need to focus on. You may take these exercises as many times as you need. The opening exercises will not affect your final grade.
- **Mastery Exercises:** Students may access and retake mastery exercises through the last day of class until they achieve the scores they desire.
- **Critical Thinking:** Assignments are due Sunday at 11:59 p.m. MT.

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## **WEEKLY READING AND ASSIGNMENT DETAILS**

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## Module 1

### Readings

- Critical Infrastructure Protection X, Chapters 1 & 2
- Kris Hemme. (2015). Critical Infrastructure Protection: Maintenance is National Security. *Journal of Strategic Security*, 8(5), 25-39.
- Vavra, C. (2016). The need for critical infrastructure specialists: Specialized experts for specific critical infrastructure projects are becoming more common as projects become more complex and more demanding. *Control Engineering*, 63(4), 80.
- Allard, S., Wathen, M., Shaefer, H., & Danziger, S. (2017). Neighborhood Food Infrastructure and Food Security in Metropolitan Detroit. *Journal of Consumer Affairs*, 51(3), 566-597.

### Opening Exercise (0 points)

### Discussion (25 points)

### Mastery Exercise (10 points)

## Module 2

### Readings

- Critical Infrastructure Protection X, Chapter 13
- National Infrastructure Protection Plan. Homeland Security. Retrieved from: <https://www.dhs.gov/national-infrastructure-protection-plan> (review site)
- Melissa M Foley, Francis J Magilligan, Christian E Torgersen, Jon J Major, Chauncey W Anderson, Patrick J Connolly, . . . Laura S Craig. (n.d.)(2017). Landscape context and the biophysical response of rivers to dam removal in the United States. *PLOS ONE*, 12(7), E0180107.
- Shelton, K. (2016). Broken bridges and highways from hell. *Nature*, 530(7590), 279-280.

### Opening Exercise (0 points)

### Discussion (25 points)

### Critical Thinking: Title (120 points)

#### Option 1

Please write a two-page white paper briefing addressing the issue of cyberinfrastructure. First, please define and describe the concept of cyberinfrastructure. Then, provide elaboration and analysis on the challenges facing the cyberinfrastructure in the United States today.

Please include both in text citations, as well as a reference list consisting of a minimum of two sources, in your analytical white-paper briefing. Your reference list sources should include the course text-book as well as a journal article reading, or a relevant website. All papers should conform to APA 6th edition citation form and style.

#### Option 2

This week pretend that you are a Public Policy Analyst in Critical Infrastructure Management. Please create a 7 slide PowerPoint presentation briefing your agency head on the concept of Cyberinfrastructure. Your slides should provide a background of the concept of cyberinfrastructure, current challenges to the nation's cyberinfrastructure, and potential solutions to those problems. Please include a reference list slide at the end of your presentation. All submissions should conform to APA 6th edition citation form and style.

### **Mastery Exercise (10 points)**

## **Module 3**

### **Readings**

- Critical Infrastructure Protection X, Chapter 12
- David Michael Birkett. (2017). Water Critical Infrastructure Security and Its Dependencies. *Journal of Terrorism Research*, 8(2), 1-21.
- Van Staaldunen, Khan, Gadag, & Reniers. (2017). Functional quantitative security risk analysis (QSRA) to assist in protecting critical process infrastructure. *Reliability Engineering and System Safety*, 157, 23-34.
- Hausken, K., & He, F. (2016). On the Effectiveness of Security Countermeasures for Critical Infrastructures. *Risk Analysis*, 36(4), 711-726.
- Sorin Dumitru Ducaru. (2017). THE SECURITY OF CRITICAL ENERGY INFRASTRUCTURE IN THE AGE OF MULTIPLE ATTACK VECTORS: NATO'S MULTI-FACETED APPROACH. *Europolity: Continuity and Change in European Governance*, 11(1), 5-20.

### **Opening Exercise (0 points)**

### **Discussion (25 points)**

### **Mastery Exercise (10 points)**

### **Critical Thinking: Title (125 points)**

#### **Option 1**

Globalization Assignment Comparative Critical Energy Infrastructure Briefing

Review the required article reading this week entitled Security of Critical Energy Infrastructure in the age of multiple attack vectors: NATO's Multifaceted approach. Write an analytical white paper briefing addressing the way NATO is addressing the strategic protection of European energy infrastructure.

The paper should be 2-3 pages, well written and formatted in CSU-Global APA standards. Cite at least three scholarly sources in addition to the textbook. The CSU-Global library is a great place to find resources!

#### **Option 2**

Globalization Assignment / Electrical Grid Comparative Contrast

Energy plays an important role in many aspects of our lives. For example, we use electricity for lighting and cooling. We use fuel for transportation, heating, and cooking. Our energy production and use is

interconnected with many other aspects of modern life, such as water consumption, use of goods and services, transportation, economic growth, land use, and population growth. Make an argument on how to support the growing demands for energy consumption in the United States.

Also, conduct internet research on the topic of comparing and contrasting the electrical grid system in the United States with the electrical grid system from another industrialized nation. What lessons could be learned from this international perspective on best practices from around the globe in this area of infrastructure protection?

The paper should be 2-3 pages, well written and formatted in CSU-Global APA standards. Cite at least three scholarly sources in addition to the textbook. The CSU-Global library is a great place to find resources!

### **Portfolio Milestone (50 points)**

#### **Option 1 & 2**

As every student knows, writing a research paper first needs the writing of the research paper outline. This is very important because the outline defines the structure, the content, and the flow of your research paper.

Submit an outline of your final project to the instructor.

Include in your outline your thesis statement. Click on link below for a sample APA Outline.

[APA Outline Resource](#)

## **Module 4**

### **Readings**

- Critical Infrastructure Protection X, Chapter 3
- Shafieezadeh, A., Cha, E., & Ellingwood, B. (2015). A Decision Framework for Managing Risk to Airports from Terrorist Attack. *Risk Analysis*, 35(2), 292-306.
- Xie, J., Stefanov, A., & Liu, C. (2016). Physical and cyber security in a smart grid environment. *Wiley Interdisciplinary Reviews: Energy and Environment*, 5(5), 519-542.
- Pereira, R., & Hausman, William J. (2017). Railroad infrastructure investments and economic development in the antebellum United States. *Journal of Economic Development*, 42(3), 1-16.
- Schulz, A., Zia, A., & Koliba, C. (2017). Adapting bridge infrastructure to climate change: Institutionalizing resilience in intergovernmental transportation planning processes in the Northeastern USA. *Mitigation and Adaptation Strategies for Global Change*, 22(1), 175-198.
- NIPP (n.d.). National Infrastructure Protection Plan: Postal and Shipping Sector. Retrieved from <https://www.dhs.gov/xlibrary/assets/nppd/nppd-ip-postal-and-shipping-snapshot-2011.pdf>

### **Opening Exercise (0 points)**

### **Discussion (25 points)**

### **Mastery Exercise (10 points)**

### **Portfolio Milestone (50 points)**

## Option 1 & 2

Portfolio Project: Literature Review & References 50 points

Locate from CSU's virtual library a minimum of three research articles on your pre-approved topic. You are to write a 1-2 page summary the general theme(s) of these articles as it pertains to your topic. A reference page, listing the articles should also be included (this does not count toward your page limit). This summary should serve as the

background/foundation for your final Portfolio Project. Each article must be cited in correct APA (6th ed.) format. See attached APA Sample Paper with References.

APA Sample Paper

## **Module 5**

### Readings

- Critical Infrastructure Protection X, Chapter 14
- Christopher Small, Tyler Blanpied, Alicia Kauffman, Conor O'neil, Nicholas Proulx, Mathew Rajacich, . . . J. Craig Swanson. (2016). Assessment of Damage and Adaptation Strategies for Structures and Infrastructure from Storm Surge and Sea Level Rise for a Coastal Community in Rhode Island, United States. *Journal of Marine Science and Engineering*, 4(4), 67.
- Rogers, D., & Lamm, F. (2015). Adaptation of Irrigation Infrastructure on Irrigation Demands under Future Drought in the United States. *Earth Interactions*, 19(7), 1-16.
- Vita-Finzi, C. (2015). The Perfect Solar Storm 1. *Proceedings of the American Philosophical Society*, 159(4), 415-420.
- Amin, S. (2015). Power and Energy Infrastructure: Cyber Security, Defense, and Resilience. *Georgetown Journal of International Affairs*, 70-82.

### Recommended Reading

- Burk, Robin (2017). An Electromagnetic Pulse Attack Could Mean No Power, Water, Food, Electricity, Cell Service and More. So Could a Cyber Attack. *PR Newswire*.

### Opening Exercise (0 points)

### Discussion (25 points)

### Mastery Exercise (10 points)

### Critical Thinking: Title (125 points)

#### Option 1

Please write a two-page white paper briefing addressing the issue of the environment and the environmental challenges facing the nation's critical infrastructure.

Please include both in text citations, as well as a reference list consisting of a minimum of two sources, in your analytical white-paper briefing. Your reference list sources should include the course text-book as well as a journal article reading, or a relevant website. All papers should conform to APA 6th edition citation form and style.

## Option 2

Once again, this week, please pretend that you are a Public Policy Analyst in Critical Infrastructure Management. Please create a 7 slide PowerPoint presentation briefing your agency head on the concepts relating to environmental challenges facing the critical infrastructure of the United States.

Please include a reference list slide at the end of your presentation. All submissions should conform to APA 6th edition citation form and style.

## **Portfolio Milestone (50 points)**

### Option 1 & 2

#### Abstract

Begin a new page. Your abstract page should already include the page header. On the first line of the abstract page, center the word "Abstract" (no bold, formatting, italics, underlining, or quotation marks).

Beginning with the next line, write a concise summary of the

key points of your research. (Do not indent.) Your abstract should contain at least your research topic, research questions, participants, methods, results, data analysis, and conclusions. You may also include possible implications of your research and future work you see connected with your findings. Your abstract should be a single paragraph double-spaced. Your abstract should be between 150 and 250 words.

You may also want to list keywords from your paper in your abstract. To do this, indent as you would if you were starting a new paragraph, type Keywords: (italicized), and then list your keywords. Listing your keywords will help researchers find your work in databases. For an example, click on the following document:

[Abstract Resource](#)

## **Module 6**

### **Readings**

- Critical Infrastructure Protection X, Chapter 10
- Hasnat, B. (2015). US National Security and Foreign Direct Investment. *Thunderbird International Business Review*, 57(3), 185-196.
- Vavra, C. (2016). The whitelist: Finding the light in cyber darkness. *Control Engineering*, 63(4), 42.
- Shackelford, S., & Bohm, Z. (2016). Securing North American critical infrastructure: A comparative case study in cybersecurity regulation. *Canada-United States. Law Journal*, 40(1), 61.
- Arce, D. (2015). WikiLeaks and the risks to critical foreign dependencies. *International Journal of Critical Infrastructure Protection*, 11, 3-11.

### **Recommended Reading**

- Dorel Badea, Cezar Vasilescu, & Marian Coman. (2017). THE DESIGN OF A DIDACTIC GAME (CIP-v.01-THD) FOR CRITICAL INFRASTRUCTURE SECURITY MANAGEMENT. *Journal of Defense Resources Management*, 8(2), 5-13.

### **Opening Exercise (0 points)**

**Discussion (25 points)**

**Mastery Exercise (10 points)**

**Module 7**

**Readings**

- Lecklider, T. (2015). Acknowledging the HEMP threat. *EE-Evaluation Engineering*, 54(11), 30-33.
- Roe, E., & Schulman, P. (2015). Comparing Emergency Response Infrastructure to Other Critical Infrastructures in the California Bay-Delta of the United States: A Research Note on Inter-Infrastructural Differences in Reliability Management. *Journal of Contingencies and Crisis Management*, 23(4), 193-200.
- Zhou, S., & Matisoff, D. (2016). Advanced Metering Infrastructure Deployment in the United States: The Impact of Polycentric Governance and Contextual Changes. *Review of Policy Research*, 33(6), 646-665.

**Opening Exercise (0 points)**

**Discussion (25 points)**

**Mastery Exercise (10 points)**

**Module 8**

**Readings**

- Wiater, P. (2015). On the notion of "Partnership" in Critical Infrastructure Protection. *European Journal of Risk Regulation: EJRR*, 6(2), 255-262.
- Cushing, M., Hooshmand, J., Pomares, B., & Hotz, G. (2016). Vision Zero in the United States Versus Sweden: Infrastructure Improvement for Cycling Safety. *American Journal of Public Health*, 106(12), 2178-2180.
- Krupa, T., & Wisniewski, M. (2015). Situational Management Of Critical Infrastructure Resources Under Threat. *Foundations of Management*, 7(1), 93-104. (Globalization Reading)

**Opening Exercise (0 points)**

**Discussion (25 points)**

**Mastery Exercise (10 points)**

**Portfolio Project (200 points)**

**Portfolio Option 1:**

**Border Wall**

The Portfolio Option One (1) for this course entails a close examination of a very hot political issue. Students who select this portfolio option 1 will gain understanding and comprehension of the border-wall critical infrastructure public policy debate and evaluate the evidence either for or against the construction of a southern border wall for the United States.

The final paper should be Seven (7) pages long, double spaced, following APA citation form and style. Five (5) references are required. Students may cite the textbook, peer-received academic journal articles retrieved from the University Library Databases, or relevant websites.

Sample Outline:

- Introduction
- Background and History of Border Wall Public Policy in the United States
- Is the Border Wall a Necessary Piece of Critical Infrastructure?
- Evidence, Elaboration, and Argumentation either in Support or Against the Wall Project
- Conclusion

### Portfolio Option 2:

Hardening the Nation's Electrical Grid against potential Electromagnetic Pulse Attack.

The Portfolio Option Two (2) for this course will involve some in-depth research into a potential critical infrastructure public policy issue that the nation will likely need to address soon. Unlike, portfolio option one, which is a real-world current public policy issue, this issue is one on the horizon. So, keep that in mind as you research this topic if it is your selection!

Whether you have heard about this issue or not, Electromagnetic Pulse Attack, either emanating from natural (Solar Activity) or man-made (Atmospheric Nuclear Detonation), is a very real potential threat to the United States. Prepare for some exciting research in a new area of critical infrastructure public policy if you undertake the portfolio option two assignment! Please write a paper briefing the professor on this topic.

The final paper should be Seven (7) pages long, double spaced, following APA citation form and style. Five (5) references are required. Students may cite the textbook, peer-received academic journal articles retrieved from the University Library Databases, or relevant websites.

Sample Outline:

- Introduction
- Background and History of Electrical Grid in the United States
- Is Hardening the Nation's Electrical Grid Necessary to protect this Critical Infrastructure system?
- Congressional Legislation (Federal Bills that did not become Law Addressing Hardening the Nation's Electrical Grid)
- Evidence, Elaboration, and Argumentation either in Support or Against the notion of Hardening the Nation's Electrical Grid
- Conclusion

<b>Grading Scale</b>	
A	95.0 – 100
A-	90.0 – 94.9
B+	86.7 – 89.9
B	83.3 – 86.6
B-	80.0 – 83.2
C+	75.0 – 79.9
C	70.0 – 74.9
D	60.0 – 69.9
F	59.9 or below

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## **COURSE POLICIES**

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### **Course Grading**

20% Discussion Participation  
0% Opening Exercises  
8% Mastery Exercises  
37% Critical Thinking Assignments  
35% Final Portfolio Project

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## IN-CLASSROOM POLICIES

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For information on late work and incomplete grade policies, please refer to our [In-Classroom Student Policies and Guidelines](#) or the Academic Catalog for comprehensive documentation of CSU-Global institutional policies.

### **Academic Integrity**

Students must assume responsibility for maintaining honesty in all work submitted for credit and in any other work designated by the instructor of the course. Academic dishonesty includes cheating, fabrication, facilitating academic dishonesty, plagiarism, reusing /re-purposing your own work (see *CSU-Global Guide to Writing and APA Requirements* for percentage of repurposed work that can be used in an assignment), unauthorized possession of academic materials, and unauthorized collaboration. The CSU-Global Library provides information on how students can avoid plagiarism by understanding what it is and how to use the Library and Internet resources.

### **Citing Sources with APA Style**

All students are expected to follow the *CSU-Global Guide to Writing and APA Requirements* when citing in APA (based on the APA Style Manual, 6th edition) for all assignments. For details on CSU-Global APA style, please review the APA resources within the CSU-Global Library under the "APA Guide & Resources" link. A link to this document should also be provided within most assignment descriptions in your course.

### **Disability Services Statement**

CSU-Global is committed to providing reasonable accommodations for all persons with disabilities. Any student with a documented disability requesting academic accommodations should contact the Disability Resource Coordinator at 720-279-0650 and/or email [ada@CSUGlobal.edu](mailto:ada@CSUGlobal.edu) for additional information to coordinate reasonable accommodations for students with documented disabilities.

### **Netiquette**

Respect the diversity of opinions among the instructor and classmates and engage with them in a courteous, respectful, and professional manner. All posts and classroom communication must be conducted in accordance with the student code of conduct. Think before you push the Send button. Did you say just what you meant? How will the person on the other end read the words?

Maintain an environment free of harassment, stalking, threats, abuse, insults or humiliation toward the instructor and classmates. This includes, but is not limited to, demeaning written or oral comments of an ethnic, religious, age, disability, sexist (or sexual orientation), or racist nature; and the unwanted sexual advances or intimidations by email, or on discussion boards and other postings within or connected to the online classroom. If you have concerns about something that has been said, please let your instructor know.