

**CYBR 555**  
**Cybersecurity Practicum Capstone**  
**West Virginia University**  
**Summer 2024**  
**Online**  
**3 credits**

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**Course Materials:** <https://ecampus.wvu.edu>

**COURSE DESCRIPTION:** Students will work with local, regional, or national businesses and industries to complete an experiential project which integrates across major areas within the cybersecurity domain, including information systems management, cybersecurity analytics, software security, information security assurance, data communications, network security, information ethics, legal procedures, penetration testing, enterprise security architecture, operational technology and industrial control system security, critical infrastructure protection, and data visualization, to address, resolve, or elucidate a basic or applied cybersecurity problem.

**COURSE CONTENT:** This capstone course brings together the different cybersecurity elements from previous courses in the Business Cybersecurity Management program with a view to understanding how best to leverage cybersecurity knowledge, skills, and expertise to become more effective cybersecurity leaders. Students are expected to work effectively within peer teams to develop optimal security solutions to resolve existing problems encountered in an organization. Students will have an opportunity to apply the concepts, principles, and methods of the Business Cybersecurity curriculum to real-world basic and applied cybersecurity problems currently facing the industry.

**LEARNING OUTCOMES:** Upon completion of this course, students will be able to:

- Prepare an effective business cybersecurity strategy and explain this strategy in the business cyber report
- Conduct in-depth research on advanced cybersecurity topics to address a basic or applied cybersecurity research problem.
- Apply appropriate cyber security technical tests to determine the overall security of the organization and include the outcomes in the capstone paper and presentation
- Construct a security analysis using the organization's real-world systems
- Assess options for how to improve the security strategies and mitigate future risk.
- Create a full business cybersecurity analysis report with recommendations and project summary
- Construct and deliver a professional presentation describing the experiential learning business cyber project.

**COURSE PREREQUISITES:** CYBR 545, CYBR 550

**COURSE CO-REQUISITES:** CYBR 515 (CYBR 593A) or BUDA 550

**COURSE ACTIVITIES:**

- ***Project Overview.*** Report outlining the context, scope, and requirements of the Capstone project. Support the list of requirements by identifying individuals and resources required to support the project. Include information on any work already completed for the project. Identify risks and threats to executing the project. Maximum 2-3 pages. Submit as .docx or .pdf to eCampus.
- ***Bi-weekly Updates.*** Summary of work completed that week and work planned for the following week. Include specific work assignments for individual team members and report any emerging risks and suggest strategies to avoid them. Submitted on eCampus using the designated tool.
- ***Team Participation.*** Members are required to submit two evaluations of their teammates' contributions to the Capstone project. The first evaluation will be conducted mid-summer, and the second at the end of the semester. Submitted on eCampus using the evaluation tools
- ***Project Presentation.*** During the final online residency each team will make a 30- to 40 - minute formal presentation to their corporate partner and the MIS department (if permitted by NDA). The presentation should focus on the findings and results of the project, with supporting information on how those findings, results, and conclusions were developed and identified. The formal polished presentation should be on par with the quality of an executive-level business presentation or an international scientific conference. For the corporate partner presentation, 30- to 40-minutes will be allocated for Q&A and discussion of findings. Presentation materials may use the platform of your choice, submit to eCampus (if there are multiple files, zip them into a single file and submit that .zip file).

- **Final Project Report.** This report is a summary of the entire project, from start to finish. This report should specifically address the client's problem and clearly communicate your findings. Additionally, this report should also consider the instructor -and possibly any faculty advisors- who will grade your report based on your efforts. This report will likely be lengthy and will require the team to directly address specific concepts, tools, and knowledge taught in the overall Business Cybersecurity Management curriculum. Think of this as constructing a rough draft of a long professional white paper or an academic paper on your capstone project.

*Tip: Write the report for the instructor/faculty first, then streamline it for the corporate deliverable.*

*Tip: If you write your bi-weekly reports very well and in a logical structure, you can easily combine the content into a comprehensive final project report. Work smart!*

Below is the structure of your final report. You may add additional sections if needed:

- Formal Project Title
- Introduction to the project problem
- Background/expansion of introduction to project topic
- Project purpose, project goals, business need.
- Methodology & Process
  - Detailed description of the methodology, processes, and tools considered and used, including an explanation of how methods were chosen, evaluated, and tested.
  - Include figures, tables, and visualizations where applicable.
- Interpretation of results (or business analysis if applicable)
- Discussion and lessons learned, business recommendations, and next steps
- Conclusion
- References

In order to facilitate grading and recognize the variation in report structure and length, it is recommended that a checklist of these criteria be taken and information on where in the report to find each item be given.

Additional basic guidelines:

- The report should have a cover page with the title, names of the student team and instructor/mentor faculty, an abstract, and table of contents.
  - For those unfamiliar with scientific abstracts, an abstract is a brief overview of the paper/project to give the reader an understanding of the project without having to read the entire paper. Good abstracts are one of the more difficult things to write, treat this with care.
- Should include an introduction, background, problem description, methods, solution narrative, discussion of project findings, conclusions, and references.

- Reference style should be in APA or IEEE format and consistent throughout the document and references page.
- Figures and tables may be included in the body of the essay or in appendices.
- Professional standards are expected with respect to rigor, content, organization, English writing, citations, and attention to detail.
- Communicate frequently with faculty during paper development and allow sufficient time for the revisions needed to complete the project.
- Submit as a .docx or .pdf file, supporting files may take any format. If there are supporting files, zip all items into a .zip file and submit that to eCampus.

**Grading Scale:** >90% A; 80-89.9% B; 70-79.9% C; 60-69.9% D; <60% F

**Course Grading:** All assessments are scored out of 100 points. However, the weighting of each assessment will vary, as detailed below.

<u>Activity</u>	<u>Due Date</u>	<u>% of total grade</u>
Project Overview	05/17/2024	10%
Project Updates	Bi-weekly, Friday of the week	20% (4 x 5%)
Team Participation	08/01/2024	20% (2 X 10%)
Final Presentation	07/29/2024 – 08/02/2024	20%
Final Project Report	08/02/2024	30%
Total		100%

**Computer Hardware and Software:** All students must have internet connectivity, access to Microsoft Office, and access to the WVU provided or open source analytical tools needed to execute the project.

**Class Meetings and Virtual Meetings:** The presentation of this course will occur primarily through asynchronous delivery of course material. Students will work with the experiential learning organization semi-independently of the instructor and faculty mentor and conduct virtual meetings with the instructor and faculty mentor at various required touch points across the class period.

**Attendance:** There is no residency associated with this course. Although the course is designed for asynchronous learning, periodic synchronous meetings with the faculty instructor and industry partner will occur, as will the final presentation to the industry partner. Your instructor may impose additional meeting times if needed to help keep your project on track or if you fall behind.

**Makeup Assignments:** The due dates for this final assignment should be taken seriously. Should outside commitments cause a problem in meeting a due date, contact the instructor to arrange a resolution to the conflict.

**Academic Integrity:** The integrity of the classes offered by any academic institution solidifies the foundation of its mission and cannot be sacrificed to expediency, ignorance, or blatant fraud. Therefore, I will enforce rigorous standards of academic integrity in all aspects and assignments of this course. For the detailed policy of West Virginia University regarding the definitions of acts considered to fall under academic dishonesty and possible ensuing sanctions, please see the West Virginia University Academic Catalog at

<http://catalog.wvu.edu/undergraduate/coursecredittermsclassification/#academicintegritytext>.

Should you have any questions about possibly improper research citations or references or any other activity that may be interpreted as an attempt at academic dishonesty, please see me before the assignment is due to discuss the matter.

**Inclusivity Statement:** The West Virginia University community is committed to creating and fostering a positive learning and working environment based on open communication, mutual respect, and inclusion. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with the Office of Accessibility Services (293-6700). For more information on West Virginia University's Diversity, Equity, and Inclusion initiatives, please see

<http://diversity.wvu.edu>.

## Schedule:

The schedule below is the expected schedule for this class. The instructor may change this schedule if needed. **All assignments are due on the last day of week @11:59PM.** For example, the first assignment, the project overview, is due on May 26<sup>th</sup>, 2024 @11:59PM.

<b><u>Class</u></b>	<b><u>Topic</u></b>	<b><u>Assignments Due</u></b>
<b>Week 1</b> <b>May 13-19</b>	Group Orientation / Kick-off Meeting with Instructor. Arrange/conduct introductory meetings with industry partner	None
<b>Week 2</b> <b>May 20-26</b>	Group Organization / Project Setup / Finalize industry partner orientation	Project Overview
<b>Week 3</b> <b>May 27–Jun 2</b>	Independent Teamwork on Capstone Project – Check in with instructor and industry project lead as needed	None
<b>Week 3</b> <b>Jun 3-9</b>	Independent Teamwork on Capstone Project – Check in with instructor and industry project lead as needed	Project Update #1
<b>Week 5</b> <b>Jun 10 – 16</b>	Independent Teamwork on Capstone Project – Check in with instructor and industry project lead as needed	None
<b>Week 6</b> <b>Jun 17-23</b>	Independent Teamwork on Capstone Project – Check in with instructor and industry project lead as needed	Bi-weekly Update #2
<b>Week 7</b> <b>Jun 24-30</b>	Independent Teamwork on Capstone Project – Check in with instructor and industry project lead as needed	Submit Team Participation Evaluation #1
<b>Week 8</b> <b>Jul 1-7</b>	Independent Teamwork on Capstone Project – Check in with instructor and industry project lead as needed	Bi-weekly Update #3
<b>Week 9</b> <b>Jul 8-14</b>	Independent Teamwork on Capstone Project – Check in with instructor and industry project lead as needed	None
<b>Week 10</b> <b>Jul 15-21</b>	Independent Teamwork on Capstone Project – Check in with instructor and industry project lead as needed	Bi-weekly Update #4
<b>Week 11</b> <b>Jul 22-Jul 28</b>	Independent Teamwork on Capstone Project – Check in with instructor and industry project lead as needed	None
<b>Week 12</b> <b>Jul 29-Aug 4</b>	Online Residency / Presentations Jul 29 – Aug 4	Final Presentation (08/04/2024) Final Project Report (08/04/2024) Submit Final Team Participation Evaluation (08/04/2024)