SYLLABUS
CYSA 520 – 740
Fall-B 2023

(Reading Time ~ 12 minutes 17 seconds)

Course Description
CYSA 520 PRINCIPLES OF CYBERSECURITY FOR DATA ANALYTICS (3). A study of cybersecurity to support the principles of confidentiality, integrity, and availability as it applies to data analytics. Topics include evaluating system configurations, performing threat analysis, designing risk mitigation techniques, and understanding applicable policies, laws, and regulations.

Class Meetings
This is an asynchronous online course (web class) and there are no regularly scheduled class meetings.

Instructor
Dr. Mark Ciampa, #228 Grise Hall, mark.ciampa@wku.edu

I am a Professor of Computer Information Systems and the program director of the graduate Cybersecurity Data Analytics program in the Gordon Ford College of Business at Western Kentucky University in Bowling Green, Kentucky, and hold a PhD from Indiana State University in Digital Communication Systems. Prior to this I was an Associate Professor and served as the Director of Academic Computing at Volunteer State Community College in Gallatin, Tennessee for 20 years. I have worked in the IT industry as a computer consultant for businesses, government agencies, and educational institutions. I have published over 25 articles in peer-reviewed journals and books. I have also written over 30 college technology textbooks, including *CompTIA CySA+ Guide to Cybersecurity Analyst 2e, CWNA Guide to Wireless LANs 3ed, Guide to Wireless Communications, Security+ Guide to Network Security Fundamentals 8e, Security Awareness: Applying Practical Security in Your World 5e,* and *Networking BASICS*.

Virtual Office Hours
Online virtual office hours via Zoom are Monday from 9:30 AM to 2:00 PM and Wednesday from 1:00 PM to 4:00 PM. If you wish to meet with me using online virtual office hours, you must send to me an email message at least 24 hours in advance with the date and time you are requesting a meeting. If there is not a meeting already scheduled with another student, then I will send back to you a Zoom link for that meeting. If there is a conflict, I will alert you so that an alternative time can be arranged between us.

Big Red Backpack
The Big Red Backpack (BRB) program is the title of WKU's partnership with Barnes & Noble College for their First Day Complete initiative. Big Red Backpack is a course materials delivery program that

ensures students have their required course materials on the first day of class and may reduce the costs of materials for many of their courses. Enrollment in the program occurs automatically when students register for classes. Students may opt out of the program each semester, as long as they choose to opt out for all of their classes.

Students must carefully and completely follow all instructions regarding the Big Red Backpack Program. Those instructions will be provided by:

1. An email to all Topper email addresses from the Big Red Backpack Program one month prior to the start of classes.
2. The Big Red Backpack Program site

Students should refer to the Big Red Backpack Program site referenced above for opt-out deadlines and any additional details.

Required Materials

The required material is Cengage MindTap for *CompTIA Security+ 7e*. The electronic version of the textbook (eBook) is included in the MindTap platform so there is no need to purchase a separate print textbook.

Purchasing options include 1) participating in the WKU Big Red Backpack program (see above), which will provide automatic access to the MindTap platform through Blackboard; 2) purchasing Cengage MindTap for *CompTIA Security+ 7e* from the WKU Store; 3) purchasing Cengage MindTap for *CompTIA Security+ 7e* directly from the publisher (https://www.cengage.com/c/comptia-security-guide-to-network-security-fundamentals-7e-ciampa/9780357424377PF/ and click the "MindTap" tab); or 4) purchasing *Cengage Unlimited* that gives access to all textbooks and materials that Cengage produces (https://www.cengage.com/unlimited/)

Technology

Students must be competent in the use of computers, the Internet, browsers, and other common applications. Students must be able to use Cengage MindTap, WKU email, and tools in Blackboard Ultra including course messages, assignments, discussion board forums, and tests. Students who experience technical problems should contact the appropriate resource:

- WKU Information Technology Services Helpdesk - https://www.wku.edu/its/service-desk/
- Blackboard Student Support - https://help.blackboard.com/Learn/Student
- Cengage Technical Support - https://www.cengage.com/help-center/

Activities

Below is a summary list of the course activities and requirements that you will perform (see the document "Course Activities" on Blackboard for more detailed information)

1. *Complete Course Orientation Activities*
2. *Read Textbook Modules* - You will read two textbook modules (chapters) each week
3. *Perform Module Activities* – You will complete activities and live virtual machine labs that accompany each module.
4. *Take Module Quiz* – There is a quiz for each module and can only be taken once.

5. *Engage in Discussions* – You will make postings to a discussion activity and interact with other students.
6. *Take Final Exam*

Students may discuss any aspect of a grade received for up to seven (7) calendar days after the grade is posted. After this deadline the grade can no longer be reviewed.

Deadlines
The initial discussion posting deadline is Friday at 8:00 AM for that week; all other weekly assignments must be completed and submitted by Sunday at 11:59 PM for that week. No late assignments are accepted.

Grading Percentages

Event	Percentage
Module Activities	60%
Discussions	20%
Final Exam	20%

Grading Scale

Percentage	Letter Grade
90-100%	A
80-89%	B
70-79%	C
60-69%	D
0-59%	F
Other	I (Incompletes are handled on a case-by-case basis)

Grading Principles
1. Students will **no**t be allowed to turn in assignments after the deadline has passed.
2. Students will **not** be allowed to "re-do" assignments after they have been graded.

Withdrawal Dates
- October 18 - Last day to withdraw and receive a "No Grade"
- November 15 - Last day to withdraw and receive a grade of "W"

Email
Throughout the semester emails will be sent to the WKU email account of students. You are responsible for reading these messages. Due to the online nature of this class email may be the preferred communication method, with an expected response time within 24 hours during the week

and 36 hours on the weekend. Because of the number of classes that I'm teaching the volume of emails that I receive from students email messages must be filtered. In order for your messages from this class to be filtered properly and receive my top attention it is required that the subject line of your email is as follows: CYSA 520 – Your Name – Topic of Message (*CYSA 520 – Pia Romanelli – Quiz 2 Question*). Under normal circumstances I will respond no later than 24 hours after receiving your email IF it has this subject line; email messages without this subject line may be returned to you or not be answered promptly.

COVID-19

All students are strongly encouraged to get the COVID-19 vaccine. In accordance with WKU policy, all students must call the WKU COVID-19 Assistance Line at 270-745-2019 within 4 hours of testing positive for COVID-19 or being identified as a close contact to someone who has tested positive. The COVID Assistance Line is available to answer questions regarding any COVID-19 related issue. This guidance is subject to change based on requirements set forth by federal, state, and local public health entities. Please refer to the Healthy on the Hill website for the most current information (www.wku.edu/healthyonthehill)

ADA Accommodations

In compliance with university policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, Room 1074. The SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at sarc.connect@wku.edu. Please DO NOT request accommodations directly from the professor or instructor without a faculty notification letter (FNL) from the Student Accessibility Resource Center.

Students with an FNL should NOT email the FNL to the instructor requesting a signature. Instead, students must first meet with the instructor during scheduled office hours to discuss how the accommodations requested will be served in this course.

The Blackboard Ally tool has been enabled within the Blackboard course site that allows you to have access to different formats of course files, including HTML, readable PDF, electronic braille, ePub, and audio (mp3). You may review the Ally for Students video regarding how to access these alternative formats.

Additional Assistance

- *Research Appointments with your Personal Librarian*: If you need assistance locating and evaluating information for your research assignments, WKU Libraries can help. You can access the Analytics and Information Systems research guide, contact the Business Librarian at Katherine.howell@wku.edu or schedule an appointment.
- *Writing Center Assistance:* The Writing Center on the Bowling Green campus will have writing tutors available to offer advice to current WKU students on any stage of their writing projects. In-person tutoring is available in Cherry Hall 123 from 10:00 AM to 4:00 PM Monday through Friday and in the Cravens Commons (at the horseshoe-shaped reference desk) from 5:00 PM to

9:00 PM on Sunday through Thursday evenings. Making appointments, as well as instructions and how-to videos are available through the website. Walk-in feedback may be available, and students may also request feedback on their writing via email or arrange a real-time Zoom conference to discuss a paper. Students may also get short writing questions answered via email line sent to *writingcenter@wku.edu* by entering *Quick Question* in the subject line. The WKU START Centers will be offering writing tutoring sessions via Zoom as well as in person in their Glasgow and Elizabethtown locations. More information is available at WKU Start Center.

- *WKU Counseling and Testing Center* - The university experience should be challenging, but not overwhelming. To this end, the WKU Counseling Center provides a variety of services to help strengthen students' capacity to tolerate distress, form healthy relationships, and seek healthy expressions of their ideals and values. If you would like to speak with someone, you may contact WKU's Counseling and Testing Center at 270-745-3159 or use their Here To Help service at https://www.wku.edu/heretohelp/heretohelpemail.php. If you need immediate help, please visit the Counseling Center in 409 Potter Hall or call the 24-hour emergency help line at 270-843-4357.

- *Mental Health Support Group* - A Free Support/Recovery Group for current WKU students struggling with anxiety, depression, or other mental health issues is available. This is an opportunity for students to support, connect with, and encourage others struggling with mental health issues and is led by two National Alliance on Mental Illness (NAMI) certified facilitators who are in mental health recovery themselves. This group has the support of the WKU Counseling and Testing Center and is a not a substitute (rather a supplement) for therapy or medication. No formal mental health diagnosis is required for students to attend. The group is sponsored by the NAMI-Bowling Green Chapter.

- *Peer Tutoring Services* - The Learning Center (TLC) provides free tutoring services helps students enhance their academic performance and sharpen their skills to be successful WKU University graduates.

Title IX /Discrimination & Harassment

Western Kentucky University (WKU) is committed to supporting faculty, staff and students by upholding WKU's Sex and Gender-Based Discrimination, Harassment, and Retaliation (#0.070) and Discrimination and Harassment Policy (#0.2040). Under these policies, discrimination, harassment and/or sexual misconduct based on sex/gender are prohibited. If you experience an incident of sex/gender-based discrimination, harassment and/or sexual misconduct, you are encouraged to report it to the Executive Director, Office of Institutional Equity/Title IX Coordinator, Ena Demir, 270-745-6867 or Title IX Investigators, Michael Crowe, 270-745-5429 or Joshua Hayes, 270-745-5121. Please note that while you may report an incident of sex/gender based discrimination, harassment and/or sexual misconduct to a faculty member, WKU faculty are "Responsible Employees" of the University and MUST report what you share to WKU's Title IX Coordinator or Title IX Investigator. If you would like to speak with someone who may be able to afford you confidentiality, you may contact WKU's Counseling and Testing Center at 270-745-3159.

Academic Dishonesty

"[Academic dishonestly] is a very serious academic offense. In a way, the very foundation of the

American educational system rests on the issue of trust, and this trust depends on an honest exchange between students and their teachers. Just as students need to trust that teachers are honest about grading, teaching, and advising, teachers need to trust that students will be honest when taking tests and writing papers. Plagiarism, or any type of cheating, seriously undermines this foundation. This sort of dishonesty indicates that there may be serious questions about the offending student's ethics, and the stigma of this unethical behavior may follow the student for years—decreasing the student's chances of success in academic and professional work (adopted from Department of English Policy and Frequently Asked Questions on Plagiarism).

Students are expected to do work that is assigned to them and submit products that represent personal and individual effort **only**. This principle generally applies to all work done for a class, regardless of the nature of the assignment. When students breach this fundamental guideline, it can be safely assumed that academic dishonesty has occurred. Examples include:

1. In an exam setting
    a. Presenting as your work test answers that are not your work, which includes i)Using resources other than those specifically allowed by the instructor (e.g., notes or another person); ii) Copying from another student's test; iii)Using notes from any source during a test when notes are not allowed; iv)Using materials that the instructor is not making available to the whole class; v) Recycling an assignment that has been used in another course
    b. Acquiring a copy of the exam without permission
    c. Providing answers for or soliciting answers from another student with or without permission of the other student
2. On a written assignment
    a. Presenting as your own work duplicated work that you did not create by i)Purchasing written work from an external source; ii) Copying work from a free external source (online or otherwise); iii) Presenting as your work something another person has created
    b. Altering text from another source or altering select words of some original text in order to conceal plagiarism
3. Other
    a. Providing money or favors in order to gain academic advantage
    b. Falsely stating that work was given to the instructor at a certain time when it was not
    c. Correcting the responses of a graded assignment and presenting them to the instructor as incorrectly graded material
    d. Pretending to be someone you are not; taking the place of another
    e. Any other behavior that violates the basic principles of integrity and honesty

(Adopted from College of Education and Behavioral Sciences Academic Integrity Statement)

The WKU policy permits a faculty member to fail the student on the item on which academic dishonestly occurred or for the entire course. Cases of academic dishonesty will be handled as followed:
1. The student will receive a zero (0) for the assignment or an F for the course.

2. The incident will be reported to the CIS department chairperson.
3. The incident will be reported to the Dean of the College of Business.
4. The incident will be reported to the Office of Student Conduct. The student will notified of the violation and a disciplinary conference will be scheduled. At this meeting the Director will complete in the presence of the student the following forms: Judicial Process form, Disciplinary Outcome Conference form, and Parental Notifications and Creative Discipline Referral forms. Once the student accepts responsibility for violating university policies the sanction process begins to change the student's behavior and create a commitment to living within the standards of the Code of Conduct. In addition notifications will be sent to the appropriate stakeholders. A permanent reference to the incident may be placed on the student's permanent transcript.
5. Expulsion from the University may occur at the recommendation of the University Disciplinary Committee.

For this course academic dishonestly includes, but is not limited to, using any unapproved sources for completing an exam or sharing information on assignments.

Artificial Intelligence (AI) Tools
Despite the fact that artificial intelligence (AI) dates back decades and has been widely used in business for several years, the interest in AI exploded on the scene in late 2022 with the widespread introduction of ChatGPT, DALL-E, and similar tools. Because of the nature of these tools and how they gather the data to be used in them, there are significant questions about their accuracy, the usage of copyrighted material, and their biases. Over time these issues likely will be tested through general practice, the legal system, and government regulations. However, at the present time questions regarding the usage of AI remain unanswered.

For this course AI tools are not prohibited for use when you are researching topics. However, you should be aware that content generated through AI is not always accurate and any results should be verified through researching multiple other sources, just as you should do when conducting any research.

For this course AI tools **are prohibited for generating content for any activity that will be submitted for a grade** and then submitted as if you had created that material. If you submit content for a grade that has been generated by AI, your actions will be considered as academic dishonesty and will be treated as such.

Regular and Substantive Interaction (RSI)
The U.S. Department of Education requires that distance education courses must include regular and substantive interaction between students and faculty. For more information about Regular and Substantive Interaction at WKU, please visit the Regular and Substantive Interaction in Online and Distance Learning webpage. In this course, regular and substantive interaction will take place in the following ways:
- Assignments due at regular and predictable intervals

- Engaging in discussions with questions that lead to higher level thinking
- Announcements that provide information or respond to questions

Course Outline

Module 1, "Introduction to Security," introduces the cybersecurity fundamentals that form the basis of the Security+ certification. The module begins by defining information security and identifying attackers. It also looks at vulnerabilities in systems and the types of attacks that take advantage of the vulnerabilities.

Module 2, "Threat Management and Cybersecurity Resources," looks at threat management as it pertains to penetration testing and vulnerability scans. The module also explores cybersecurity standards, regulations, frameworks, and configuration guidelines.

Module 3, "Threats and Attacks on Endpoints," focuses on network-connected hardware devices, better known as endpoints. It begins by looking at attacks using various types of malware and then surveys application attacks. It also examines adversarial artificial intelligence attacks.

Module 4, "Endpoint and Application Development Security," describes different sources of threat intelligence information. The module also explores securing endpoint devices and creating and deploying secure applications to run on those devices.

Module 5, "Mobile, Embedded, and Specialized Device Security," looks at securing mobile devices. As users have embraced mobile devices, so too have attackers embraced them as targets. This module also explores embedded systems and the Internet of Things devices. Finally, it examines keeping specialized devices secure.

Module 6, "Basic Cryptography," explores how encryption can be used to protect data. The module covers what cryptography is and how it can be used for protection, and then examines how to protect data using three common types of encryption algorithms: hashing, symmetric encryption, and asymmetric encryption. It also covers how to use cryptography on files and disks to keep data secure.

Module 7, "Public Key Infrastructure and Cryptographic Protocols," examines how to implement cryptography and use digital certificates. It also looks at public key infrastructure and key management. This module covers cryptographic protocols to see how cryptography is used on data that is being transported and concludes with how to implement cryptography.

Module 8, "Networking Threats, Assessments, and Defenses," begins a study of network attacks and defenses. First the module explores some of the common attacks that are launched against networks today. Then it looks at tools for assessing and defending networks. Finally, it examines physical security defenses that can be used to protect network technology devices.

Module 9, "Network Security Appliances and Technologies," examines security appliances that provide resilience to attackers, such as firewalls, proxy servers, deception instruments, and other security appliances. It also explores security technologies such as access technologies, technologies for monitoring and managing and network, and principles for designing a secure network.

Module 10, "Cloud and Virtualization Security," looks at both cloud computing and virtualization. It examines what both of these technologies are, how they function, and how they can be secured. Because cloud computing relies on secure network connections, it also discusses secure network protocols.

Module 11, "Wireless Network Security," explores the attacks on wireless devices that are common today. It also identifies vulnerabilities in wireless security and examines several secure wireless protections.

Module 12, "Authentication," defines authentication and the secure management techniques that enforce authentication. This module looks at the types of authentication credentials that can be used to verify a user's identity and the techniques and technology used to manage user accounts in a secure fashion.

Module 13, "Incident Preparation, Response, and Investigation," focuses on the plans that must be made for when a cybersecurity incident occurs. These plans cover incident preparation, incident response, and then a follow-up investigation as to how the incident occurred and how similar future events can be mitigated.

Module 14, "Cybersecurity Resilience," explores the capacity of an organization to recover quickly from difficulties and spring back into shape. This module defines business continuity and why it is important. Next, it investigates how to prevent disruptions through redundancy. Finally, it explains how business policies can help provide resilience to an organization.

Module 15, "Risk Management and Data Privacy," examines two elements of cybersecurity that are of high importance to both enterprises and users. The first involves risk and the strategies for mitigating risks. It also explores data privacy and the issues that surround it.

WKU Master of Science in Cybersecurity Data Analytics

WKU MBA
GORDON FORD COLLEGE of BUSINESS