INFO 659-01 Fundamentals of Security

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INFO 659 – FUNDAMENTALS OF SECURITY

INSTRUCTOR: Gwen White  OFFICE: Smith 221  E-MAIL whiteg@xavier.edu

OFFICE HOURS: Online

Please email prior to office visit  TELEPHONE: 745-2943

Course Meets: Online


Mark Ciampa

DESCRIPTION: Introduces basic computer and network security concepts and methodologies. Covers principles of security; compliance and operational security; threats and vulnerabilities; network security; application, data, and host security; access control and identity management; and cryptography. Helps to prepare students for the COMPTIA Security+ examination.

Prerequisite: INFO 220

WILLIAMS COLLEGE OF BUSINESS MISSION: "We educate students of business, enabling them to improve organizations and society, consistent with the Jesuit tradition."

COURSE OBJECTIVES:

Upon completion of this course module, the student will be able to:

1. Explain basic security concepts.
2. Identify and explain appropriate use of security tools to facilitate security.
3. Evaluate current security issues related to computer and network systems.
4. Evaluate and select appropriate incident response procedures, disaster recovery, and risk identification techniques to ensure business continuity.
5. Differentiate various malware and systems security threats against computers and networks.
6. Explain the vulnerabilities and mitigations associated with computers and network devices.
7. Explain the proper use of common tools for carrying out vulnerability assessments.
8. Identify and describe potential application and data vulnerabilities, including buffer overflow, DLL injection, and SQL injection.
9. Explain how host firewalls, malware protection, and updates are important to application and data security.
10. Describe the importance of user accounts and associated permissions.
11. Compare and discuss logical and physical access control security methods.
12. Explain authentication models and identify components of each model.
13. Summarize and explain general cryptography concepts.
14. Demonstrate public and private key pairs for digital signing and encryption/decryption.

**Course Outline for Module**

I. Principles of Security
   A. Physical security
   B. Environmental security
   C. Information security
   D. Personnel security
   E. Network security

II. Compliance and Operational Security
   A. Risks and mitigation strategies
   B. Disaster recovery and incident response procedures
   C. Security awareness
   D. Business continuity and environmental controls
   E. Confidentiality, integrity, and availability (CIA)

III. Threats and Vulnerabilities
   A. Malware awareness
   B. Computer, social engineering, and application attacks
   C. Deterrent techniques
   D. Security threats discovery techniques
   E. Penetration testing versus vulnerability scanning

IV. Network Security
   A. Security functions
   B. Administration principles
   C. Network design elements
   D. Common protocols and ports
   E. Wireless networks

V. Application, Data and Host Security
   A. Application and data security importance
   B. Host security procedures

VI. Access Control and Identity Management
   A. Authentication services and functions
   B. Best practices
   C. Access control models

VII. Cryptography
   A. General cryptography concepts
   B. Cryptographic tools
   C. Public key infrastructure
   D. Key and certificate management

**CLASS POLICIES**

- Assignments are to be submitted by the due date or you will lose points (10% every day late until the 5th day, after the 5th day the assignment will receive a maximum of 50%). Due
dates, including late work deadlines will be indicated on the course home page. It is the student's responsibility to keep track of all due dates.

- This class has a zero tolerance for academic dishonesty. If two files are deemed to be partially copied from another student, both students will receive a score of zero for that assignment. A second infraction will result in an F grade for the course.
- Attendance is strictly required. Students will be asked to logon to Canvas each day and use the discussion link.

### EVALUATION

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<thead>
<tr>
<th>Assignments</th>
<th>Grade %</th>
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<tbody>
<tr>
<td>Paper</td>
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<tr>
<td>Discussion</td>
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<td>Labs</td>
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<td>Quizzes</td>
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<td><strong>Total</strong></td>
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### Grade Distribution

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<td>87-89.9</td>
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<tr>
<td>B-</td>
<td>80-82.9</td>
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<td>79 – below C</td>
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</tbody>
</table>

### Learning Goals – Williams College of Business

#### Graduate Program

#### Critical Thinking

*Learning Goal:* WCB graduates will be able to think logically, reason quantitatively, and utilize appropriate analytical techniques and technology when evaluating and making decisions.
Corresponding Objectives:

- (1) WCB students will collect, evaluate and synthesize information to offer solutions and support decision making.
- (2) WCB students will evaluate and articulate implications of business decisions and their impact on organizational stakeholders, both individually and in teams.

Ethics and Social Responsibility
Learning Goal: WCB graduates will be able to recognize ethical issues, discern moral implications of decision making, and be prepared, and willing, to serve as responsible and professional members of society.

Corresponding Objectives:

- (1) WCB students will recognize ethical issues and their implications on personal and business decisions.
- (2) WCB students will demonstrate the skills necessary to analyze information and make informed, ethical decisions in complex, conflicting or ambiguous environments or situations.

Effective Written and Oral Communication
Learning Goal: WCB graduates will be able to organize, support and communicate ideas clearly and effectively, employ multiple mediums of communication (e.g., written, oral and visual), and adapt communication to audience, context or purpose.

Corresponding Objectives:

- (1) WCB students will produce business documents and reports demonstrating their ability to organize and communicate ideas clearly and professionally.
- (2) WCB students will make effective presentations, accompanied by the appropriate technology, demonstrating their ability to organize and communicate ideas clearly and professionally, both individually and in teams.

Global Perspective and Cultural Diversity
Learning Goal: WCB graduates will appreciate the historical and cultural contexts of the world in which they live, demonstrate the competencies required for engaging in global business activities, and respect and value diverse peoples and perspectives.

Corresponding Objectives:

- (1) WCB students will identify and contrast key attributes of countries’ business environments.
- (2) WCB students will evaluate and integrate global economic, political, technological, environmental and societal issues into their decision making.
- (3) WCB students will integrate the concepts of respect, inclusiveness and valuing all persons into their decision making.

Understanding and Application of Knowledge Across Business Disciplines
Learning Goal: WCB graduates will be able to evaluate business from an integrative and holistic point of view, leverage the synergies between functional business areas, and demonstrate college-level mastery of their chosen discipline.

Corresponding Objectives:

- (1) WCB students will demonstrate the appropriate knowledge of accounting, economics, finance, management, management information systems, marketing,
quantitative business analytics, international issues, and the legal and social environment of business.

- (2) WCB students will evaluate business problems from an integrative point of view, including diverse business functions, competition and external environment (social, political, economic, and environmental.)
- (3) WCB students will demonstrate college-level mastery of the body of knowledge and skills relative to their major. (To be determined at the departmental level.)

**Personal and Professional Development**

*Learning Goal:* WCB graduates will be well-prepared for their future careers and appreciate the importance of continuous professional development and life-long learning.

*Corresponding Objective:*

- WCB students will articulate career goals, prepare a professional resume, demonstrate behavior-based interviewing techniques and develop a professional network.