FUNDAMENTALS OF INFORMATION SECURITY

Lecturer: Sagymbekova A. O.

Learning outcomes

Students successfully completing the course will be able to:

- describe the principles of confidentiality, integrity, and availability as they relate to data states and cybersecurity countermeasures;
- identify the tactics, techniques and procedures used by cyber criminals;
- apply technologies, products, and procedures are used to protect confidentiality, to ensure integrity, to provide high availability;
- analyze network intrusion data to verify potential exploits;
- use network monitoring tools to identify attacks against network protocols and services;
- choose various methods to prevent malicious access to computer networks, hosts, and data

List of laboratory works

1	Traditional ciphers
2	Modern Symmetric Key Encryption
3	Asymmetric Encryption Algorithms
4	Encrypting and Decrypting Data using a Hacker Tool
5	Using Wireshark to Examine Ethernet Frames, to Observe the TCP 3-Way Handshak Exploring Nmap
6	Linux administration: Locating Log Files, Linux Servers, Navigating the Linux Filesystem an Permission Settings
7	Attacking a MySQL Database
8	Extract an Executable from a PCAP
9	Interpret HTTP and DNS Data to Isolate Threat Actor
10	Isolated Compromised Host Using 5-Tuple

Basic literature

- Computer Security. Principles and Practise / William Stallings, Lawrie Brown.- Second edition.- USA: Pearson Education Inc., 2012.
- Understanding Cryptography. Paar, C.- New York, 2010
- Management of Information Security / M.E. Whitman, H.J. Mattord.- Fourth Edition.- USA: Cengage Learning, 2014

Supplementary literature

- Applied cryptography: Protocols, Algorithms, and Source Code / Bruce Schneier.- United States of America: John Wiley & Sons, Inc, 1996
- Securiti Enqineerinq / R. Anderson.- Second edition.- Canada: Wiley, 2008.
- Beautiful Security [Текст]: Leading Securuty Experts Explain How They Think / A. Oram, J. Viega.- USA, Sebastopol: O'Reilly, 2009.
- Open Source Security Tools / Raven Alder, Josh Burke.- USA: Syngress Publishing, Inc, 2007.
- Implementing Cisco Security Mnitoring, Analysis and Response System.- USA: The power of knowing, 2009.
- Security+ Study Guide / Ido Dudrawsky.- USA: Linacre house, 2010.
- Introduction to Hardware Security and Trust / M Tehranipoor; Editors: Wang Cliff.- USA: Springer, 2012.
- Cryptography Engineering : Design Principles and Practical Applications / N Ferguson, B Schneier, T Kohno.- United States of America: Wiley Publishing, Inc., 2010.
- Principles of Database Security / S. Balamurugan, S. Charanyaa.- Germany: Scholars Press, 2014.
- Cybersecurity Essentials. On-line e-book at www.netacad.com
- CCNA Cybersecurity Operations. On-line e-book at www.netacad.com
- Cybersecurity Essentials. Student Lab Source Files.
- CCNA Cybersecurity Operations. Student Lab Source Files.

Student performance evaluation system for the course

Period	Assignments	Grade (%)		Total
1st attestation	Labs (1-6) Practice (5-6) Quize (1-2) MidTerm	10 each 5 each 5 each 20	60 10 10 20	100 % (30 points)
2nd attestation	Labs (7-10) Practice (7-9) Quize (3-4) EndTerm	11*2+15*2 6 each 5 each 20	52 18 10 20	100 % (30 points)
Final exam	Written Exam	100	100	100 % (40 points)
Total	0,3*1stAtt+0,3*2ndAtt+0,4*Final			100

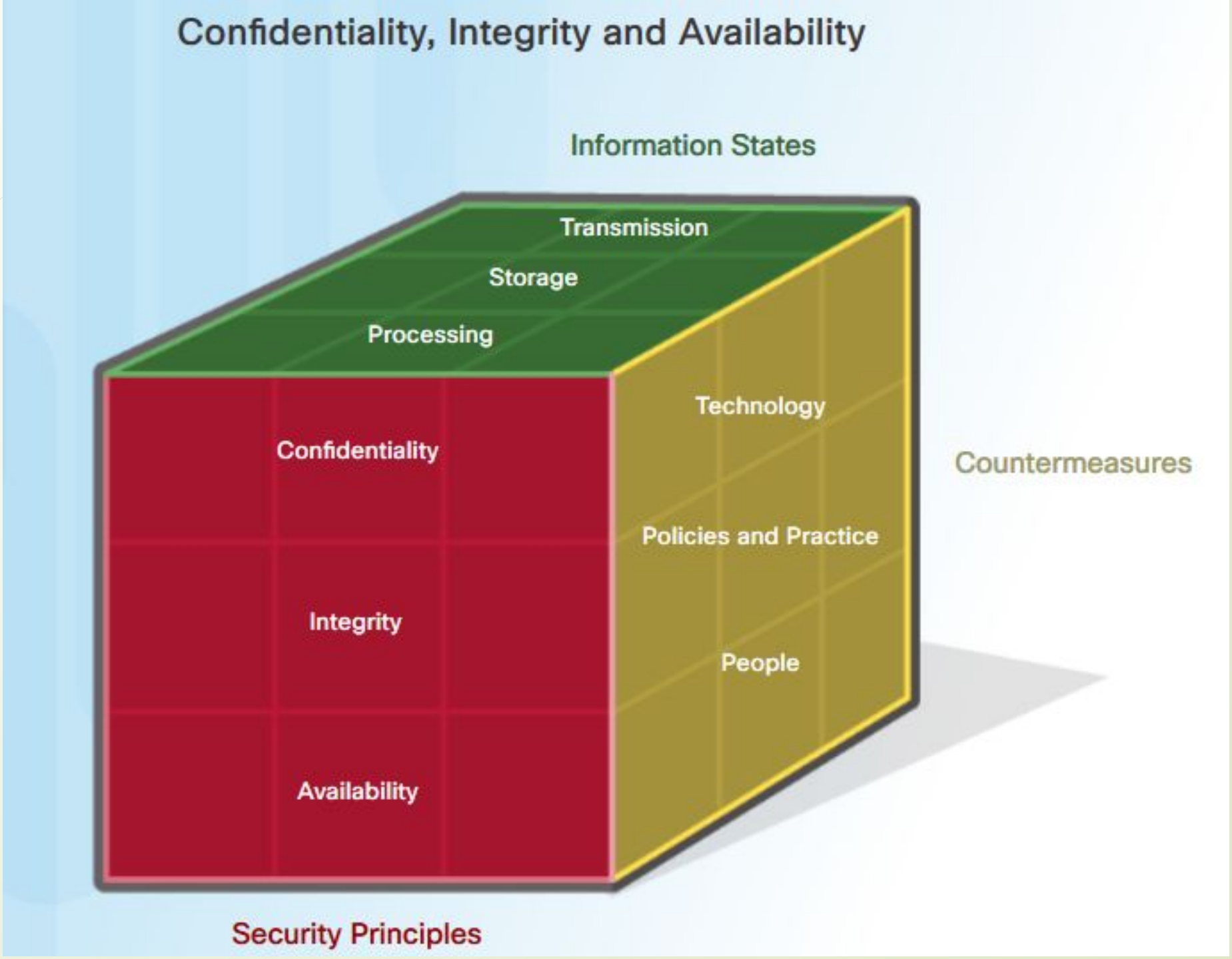
Cybersecurity principles

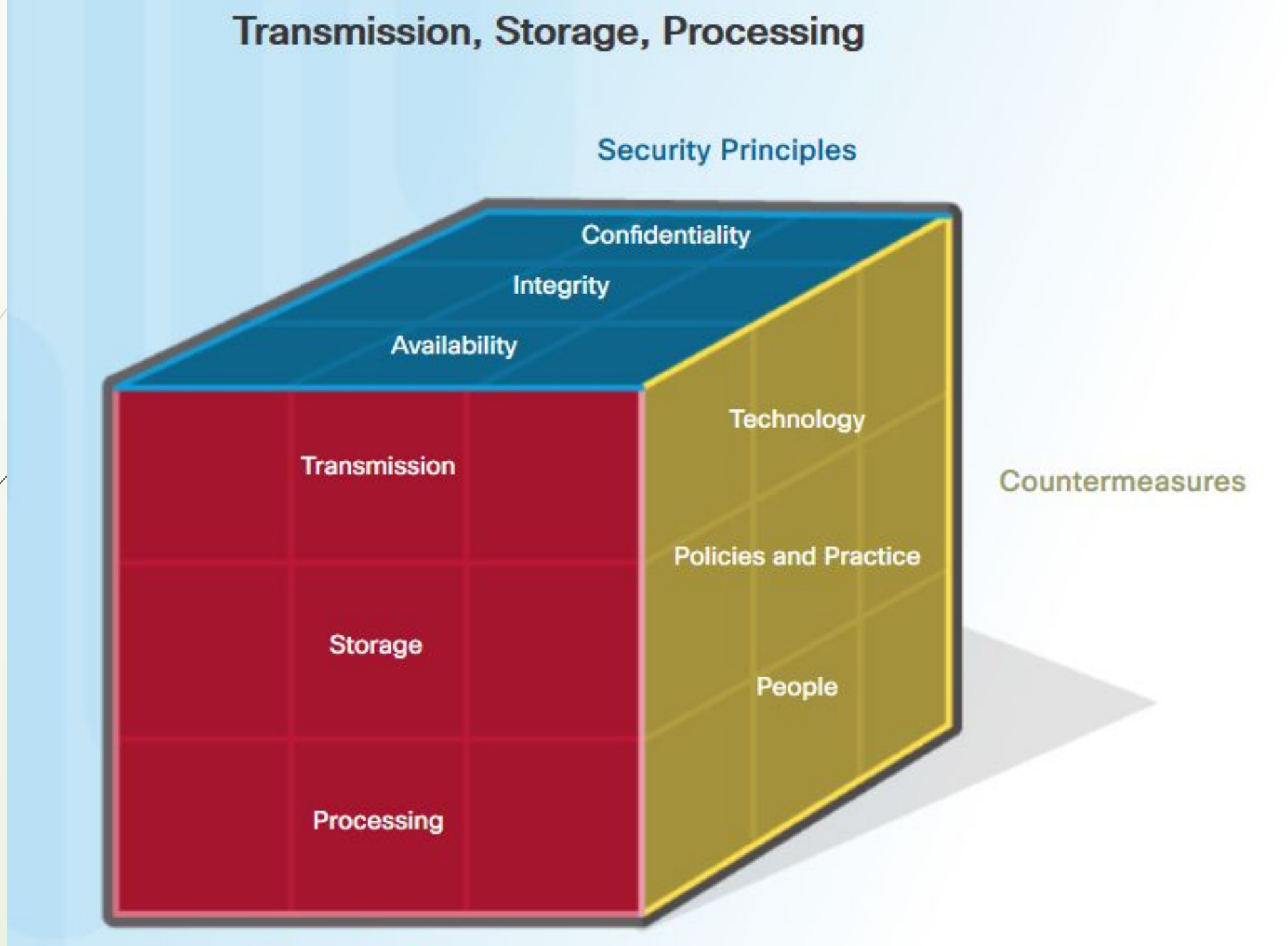
Computer Security

- protection of automated information system for preserving the integrity, availability and confidentiality of information system resources (includes hardware, software, firmware, information/data, and telecommunications).

CIA triad

- Cybersecurity experts have developed a commonly used architecture called the "cybersecurity cube". It is often used as a tool for protecting network infrastructure, domains and the Internet. The cube of cybersecurity looks like a Rubik's cube.


Confidentiality, Integrity and Availability
Information States
Transmission
Storage
Processing
Confidentiality
Integrity
Availability
Technology
Policies and Practice
People
Countermeasures
Security Principles


Transmission, Storage, Processing
Security Principles
Confidentiality
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Cybersecurity Countermeasures