WEST VIRGINIA UNIVERSITY
College of Engineering and Mineral Resources
Lane Department of Computer Science and Electrical Engineering

CS 465 - Introduction to Computer Security
Fall 2014 - 3 credit hours

Class time: Tuesday & Thursday – 9:30 - 10:45 am   **Location:** 107 MRB

Instructor: **Dr. Katerina Goseva-Popstojanova**
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Office hours: Tuesday & Thursday 11:00 am to 12:00 noon or by appointment

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Office hours: Monday & Wednesday 11:30 am to 12:30 pm or by appointment

Prerequisites: Knowledge of computer system concepts (CS350 at WVU or equivalent) or Instructor consent.

Course Materials:
Required text: Charles P. Pfleeger and Shari Lawrence Pfleeger, *Security in Computing*, Prentice Hall, Fourth edition, 2007, ISBN 0-13-239077-9
Papers selected from technical magazines, journals, and relevant conferences.

Course Description and Objectives: This course covers the fundamentals of cybersecurity. It introduces many different areas of security such as encryption, malicious code, authentication and access control, trusted computer systems, operating system and network security. The objective of this course is to provide students with a comprehensive overview of the cybersecurity threats, technologies for information assurance, and engineering approaches to build and maintain secure cyber systems and networks.

Learning Outcomes:
▪ Learn how to use encryption
▪ Be able to use appropriate protection measures against malicious code
▪ Be able to apply the modern principles of physical security, authentication, and access control
▪ Learn design principles behind trusted systems, their features and the appropriate degree of assurance
▪ Be able to plan, implement, and assess security protection mechanisms in computer systems and networks

Tentative Lectures Schedule:
1) *Security Threats and Vulnerabilities* [1 week]. What is computer security and why it is important. Threats and vulnerabilities. Attributes of computer security.
2) *Encryption* [4 weeks]. What is encryption and how it protects both stored data and communications. Secret key cryptography, public key cryptography, digital signatures.
3) *Malicious Code and Spyware* [1 week]. Malicious code, including viruses, worms, and Trojan horses. Spyware.
4) *User authentication* [1.5 week]. Password authentication, including password selection criteria and attacks on passwords. Authentication with biometric devices.
5) *System and data access controls.* [1 week]. Principles of access control. Modern OS access control.
6) *Trusted Systems* [1 week]. Basics of trusted computer systems, including the design and evaluation criteria.
7) *Database Security* [1 week]. Confidentiality, integrity and availability of databases. Inference attacks and controls.
8) *Network Security* [3.5 weeks]. Network security topics such as message confidentiality and integrity violations, and denial of service attacks. Types and examples of firewalls.

RULES OF OPERATION

Attendance: Students are expected to regularly attend lectures. Students are responsible for all material covered in the course, keeping track of assignments and examination dates.

Homework and Programming Assignments: Homework assignments will be due at the beginning of the class on the scheduled date. Programming assignments will be due at midnight on the scheduled date. Unexcused late assignments will be penalized 10% for each day late. All work submitted for the homework and programming assignments must be your own work. Evidence to the contrary will be dealt with in accordance with the WVU Student Conduct Code.

Exams: There will be a midterm exam and a final exam. The midterm exam will be administered during the seventh or eight week of the semester. The final exam will be given according to the Admissions & Records Fall Term 2014 exam schedule. Collaboration is not permitted on any part of the midterm and final exams. Evidence to the contrary will be dealt with in accordance with the WVU Student Conduct Code. Make-up exams will be given only by prior arrangement and only *under truly extraordinary circumstances*. Consistent with WVU guidelines, students absent from regularly scheduled examinations because of authorized University activities will have the opportunity to take them at an alternate time.

Grading: Semester grades will be computed roughly as follows:

Homework assignments	15%
Programming assignments	35%
Midterm exam	25%
Final exam	25%

Passing grade (more than 60%) must be obtained in both homework/programming assignments and exams in order to pass the course. Grades will generally be A = 90-100%, B = 80-89%, C = 70-79%, D = 60-69%, and F =0-59%. '+' and '-' grade may be reported if the score is near boundary.

Communication: The class Web page will contain pointers to reading materials, homework & programming assignments, and important announcements. Please check the class Web page and your mix e-mail account regularly.

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, the instructor 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 visit the Office of Student Conduct Web page http://campuslife.wvu.edu/office_of_student_conduct, which has links to the WVU Campus Student Code (http://campuslife.wvu.edu/r/download/180235) and other relevant documents and forms. 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 the instructor before the assignment is due to discuss the matter.

Other Policies:

From time to time, we will discuss vulnerabilities in widely deployed computer systems. This is not intended as an invitation to go exploit those vulnerabilities. It is important that we discuss real-world experiences in class; students are expected to behave responsibly. WVU's policy (and our policy) on this is clear: you may not break into machines that are not your own; you may not attempt to attack or subvert any system security. Unauthorized access, use, modification, destruction, or disclosure of any computer system or computer network or any computer software, program, documentation, or data contained in such computer system or computer network is computer crime.

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 Accessibility Services (293-6700). For more information on West Virginia University's Diversity, Equity, and Inclusion initiatives, please see http://diversity.wvu.edu.