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University of New Orleans Syllabi

Fall 2015

CSCI 6990

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CSCI 6990-3: Topics in System Security
Fall 2015 Course Syllabus
Dr. Irfan Ahmed

Office Location: Math 347
Office hours: Tuesday/Wednesday/Thursday 10:00-12:00
        or by appointment.
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Description: This course provides an introduction to the security of industrial control systems. The control systems are widely used to automate physical industrial processes such as gas pipeline, power generation and distribution, water filtering, waste management etc. The course introduces the basics of industrial control systems, how their components interact with each other, their network protocols, how they can be programmed, their cyber vulnerabilities and threats, and how they are tackled in Industry.

Course Prerequisites:
CSCI 4621, CSCI 4311, and some programming experience
Any prior knowledge or experience on control system is not required for this course.

Class Meeting:
Math 218, Tuesday/Thursday 12:30PM - 1:45PM

Textbook:
There is no required textbook for this course. I have listed number of reference books that we use to cover some material on ICS programming, protocols, and security. I will also provide documents for study and discussion in the class.

Reference Books:
Industrial Network Security: Securing Critical Infrastructure Networks for Smart Grid,
by Eric D. Knapp, 2nd Edition, Syngress (December 2014)

Practical Industrial Data Communications: Best Practice Techniques, by Gordon Clarke
1st Edition, Butterworth-Heinemann (2005)

Programmable Logic Controllers, by James A. Rehg
2nd Edition, Prentice Hall (2008)

Protecting Industrial Control Systems from Electronic Threats, by Joseph Weiss
Momentum Press (2010)

Cybersecurity for Industrial Control Systems: SCADA, DCS, PLC, HMI, and SIS,
by Tyson Macaulay, Auerbach Publications, 1 edition (2011)

Practical Modern SCADA Protocols: DNP3, 60870.5 and Related Systems, by Deon Reynders, 1st Edition, Newnes (2004)

Handbook of SCADA/Control Systems Security, by Robert Radvanovsky
CRC Press (2013)

Grading:
Midterm Examination   35%
Final Examination   35%
Assignments   30%

Grading Scale:
The following grading scale is used. I never curve. Grading in college courses is objective and based directly on your performance. Please don't ask me to change your grade on an assignment unless you <u>clearly</u> deserve it and can demonstrate that this is the case.

A	**90-100**	**B**	**80-89**	**C**	**70-79**
D	**60-69**	**F**	**0-59**		

Tests:
There will be one midterm and one final. The final examination is based on the material covered after the midterm. Any missed test will receive a grade of zero unless arrangements are made with me.

Exam Dates:
Midterm Exam: October 8, Thursday 2015
Final Exam: University will schedule the final exam

Assignments: There will be significant reading/laboratory/programming assignments in this course. You should consider the due date for each assignment to be a <u>hard deadline</u>.   When the due date arrives, turn in what you have. I do give partial credit, but **late submissions are not accepted.**

Submission procedures will be discussed in class.

Class Materials: The lecture slides will be available via Moodle. Be sure to check the Moodle site frequently.

Some Major Topics:
• Introduction to industrial control systems (ICS)
• ICS network protocols
• PLC programming
• ICS threats and vulnerabilities
• Risk management

- Network Penetration Testing in ICS
- …

Learning Outcomes
Students will develop good understanding of industrial control systems and their security issues and current state-of the art solutions

Academic Integrity policy:
Academic integrity is fundamental to the process of learning and evaluating academic performance. Academic dishonesty will not be tolerated. Academic dishonesty includes, but is not limited to, the following: cheating, plagiarism, tampering with academic records and examinations, falsifying identity, and being an accessory to acts of academic dishonesty. Refer to the Student Code of Conduct for further information. The Code is available online at http://www.studentaffairs.uno.edu.

Accommodations for Students with Disabilities:
It is University policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities that may affect their ability to participate in course activities or to meet course requirements. Students with disabilities should contact the Office of Disability Services as well as their instructors to discuss their individual needs for accommodations. For more information, please go to http://www.ods.uno.edu.