Department of Computer & Electrical Engineering
and Computer Science
Florida Atlantic University
Course Syllabus

1. Course title/number, number of credit hours	
Cyber Physical System Security/ CIS 4214	3

2. Course prerequisites, corequisites, and where the course fits in the program of study
Prerequisites: COP 3530 or permission of the instructor

3. Course logistics
Term: Fall 2020/ This is a classroom lecture/ This course has limited design content.   *Class location and time:* TBA

4. Instructor contact information	
Instructor's name *Office address* *Office Hours* *Contact telephone number* *Email address*	Feng-Hao Liu EE412 TBA 561-297-2341 fenghao.liu@fau.edu

5. TA contact information	
TA's name *Office address* *Office Hours* *Contact telephone number* *Email address*	TBA

6. Course description
This course will expose students to fundamental aspects of security regarding cyber-physical systems, so they will be able to apply the techniques to tackle a broad scope of current and future security challenges. Students will study several tools and techniques commonly used by a hacker to compromise a system. Then they will learn methods to defend against these attacks.

7. Course objectives/student learning outcomes/program outcomes	
Course objectives	Objectives: • Learn what cyber physical systems are • Understand why CPS are hard to secure • Analyze common techniques to secure CPS *Outcome:* • Develop ability to interact with CPS components/protocols • Develop ability to perform attacks on CPS • Develop ability to defend against attacks on CPS
Student learning outcomes & relationship to ABET 1-7 outcomes	1. An Ability to identify, formulate, and solve complex computing/engineering problems by applying principles of computing, engineering, science, and mathematics. (Problem solving)

8. Course evaluation method

Homework Assginments -	70	%	*Note*: The minimum grade required to pass the course is C.	
Final Project -	30	%		

9. Course grading scale

Grading Scale:
90 and above: "A", 87-89: "A-", 83-86: "B+", 80-82: "B", 77-79 : "B-", 73-76: "C+", 70-72: "C", 67-69: "C-", 63-66: "D+", 60-62: "D", 51-59: "D-", 50 and below: "F."

10. Policy on makeup tests, late work, and incompletes

No late work is accepted unless special permission from the instructor.

11. Special course requirements

12. Classroom etiquette policy

University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions.

13. Attendance policy statement

Students are expected to attend all of their scheduled University classes and to satisfy all academic objectives as outlined by the instructor. The effect of absences upon grades is determined by the instructor, and the University reserves the right to deal at any time with individual cases of non-attendance.
Students are responsible for arranging to make up work missed because of legitimate class absence, such as illness, family emergencies, military obligation, court-imposed legal obligations or participation in University-approved activities. Examples of University-approved reasons for absences include participating on an athletic or scholastic team, musical and theatrical performances and debate activities. It is the student's responsibility to give the instructor notice prior to any anticipated absences and within a reasonable amount of time after an unanticipated absence, ordinarily by the next scheduled class meeting. Instructors must allow each student who is absent for a University-approved reason the opportunity to make up work missed without any reduction in the student's final course grade as a direct result of such absence.

14. Disability policy statement

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses – Boca Raton, Davie and Jupiter – however disability services are available for students on all campuses. For more information, please visit the SAS website at www.fau.edu/sas/.

15. Counseling and Psychological Services (CAPS) Center

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few –

offered to help improve and maintain emotional well-being. For more information, go to
http://www.fau.edu/counseling/

16. Code of Academic Integrity policy statement

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001. If your college has particular policies relating to cheating and plagiarism, state so here or provide a link to the full policy—but be sure the college policy does not conflict with the University Regulation.

17. Required texts/reading
To reduce costs for our students, we strongly encourage you to explore the adoption of open educational resources (OER), textbooks and other materials that are freely accessible. We also encourage you to clearly state in the syllabus if course materials are available on reserve in the Library.

Industrial Network Security, Second Edition: Securing Critical Infrastructure Networks for Smart Grid, SCADA, and Other Industrial Control Systems (2nd Edition), by Eric D. Knapp and Joel Thomas Langill, ISBN: 978-0124201149

Applied Cyber Security and the Smart Grid: Implementing Security Controls into the Modern Power Infrastructure (1st Edition), by Eric D. Knapp and Raj Samani, ISBN: 978-1597499989

18. Supplementary/recommended readings

None

19. Course topical outline, including dates for exams/quizzes, papers, completion of reading

Weekly Schedule	Topics
Week 01	Introduction to Cyber-Physical Systems
Week 02	Background: Networking, Information Security, Control Systems
Week 03	Background: Networking, Information Security, Control Systems
Week 04	Industrial CPS security, history and threats
Week 05	Industrial Networks
Week 06	Introduction to Industrial Control Systems and Operations

Week 07	Industrial Network Design and Architecture
Week 08	Midterm
Week 09	Industrial Network Protocols
Week 10	Example of Industrial Control Systems
Week 11	Hacking Industrial Control Systems
Week 12	Securing Industrial Control Systems
Week 13	Privacy in CPS
Week 14	Threats to CPS in Broader Scopes
Week 15	Final