

FALL 2026: ECE 6374 Cyber-Physical Security in Electric Energy Systems: Course Syllabus

General Course Information:

Fall 2026

ECE6374-OCY

Affiliation: School of Electrical and Computer Engineering, College of Engineering, Georgia Institute of Technology (Atlanta, GA)

Delivery: 100% Web-Based, Asynchronous
Canvas and Ed Discussion

Study material:

- Pre-recorded videos
- Recorded weekly office hours
- Published lecture slides
- Selected chapters from the textbook
- Selected papers
- Practice problems

Instructor Information

A P Meliopoulos, Georgia Power Distinguished Professor

Email: sakis.m@gatech.edu

Weekly Recorded Office Hours via Zoom on Tuesdays, 7 pm to 8 pm ET (we will discuss this time the first week of classes).

Course Description

The primary objective of this course is to provide an introduction to cyber-physical infrastructure for the protection and control of electric energy systems, communication protocols and, standardization, and present practices for cyber security. The course will allow students to study the complex cyber-physical infrastructure for protection and control of electric energy systems, their design principles, become familiar with communication protocols and standardization, identify cyber vulnerabilities of electric energy systems, learn how to protect against cyber-attacks, and understand present practices for cyber security.

Pre- &/or Co-Requisites

Graduate standing, fundamental background in electric energy systems (a short session will be delivered at the beginning of the semester to introduce students to the essential background).

Course Goals and Learning Outcomes

Once completed, the students should have the following capabilities:

- Explain the cyber threats to the electric power grid, including disruptions, denial of service, and physical damage
- Examine the cyber infrastructure of modern electric energy systems
- Describe the protection, control, and operation functions of an electric energy system and the computer network infrastructure that enables these operations

- Describe communication protocols within electric facilities and across electric facilities and encryption of communications
- Examine intrusion detection systems applicable across all operations of the electric power grid
- Examine electric energy system tracking via dynamic state estimation and use of system knowledge to detect attacks and malicious commands timely; contain and block the attack
- Describe industry standards for best cybersecurity practices

Course Materials

Course Website and Other Classroom Management Tools

This class will use Canvas, a Learning Management System (LMS), for all announcements, project assignments, project submissions, exams, and posting of scores and grades. We will also use Ed Discussion to ask questions about the course material and students' discussions. More details about submitting projects, taking exams, etc., will be announced (via Canvas announcements) during the semester as we release the projects and exams.

Course Requirements, Assignments & Grading

Assignment Distribution

Grading Type	Description of Graded Assignments	% Grade
Homework	Six homework assignments	20%
Midterm Exam	One midterm exam	20%
Projects	Two projects	30% (15% each)
Final Exam	Comprehensive – several problems	30%

Grading Scale

Your final grade will be assigned as a letter grade according to the following scale:

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

Description of Graded Components

- **Midterm Exam:** This course has one midterm test to test knowledge acquired in the first half of the semester—the midterm exam open book. Once you start the midterm, you have three (3) consecutive hours to complete and submit.

Assignment	Date Assigned	Due Date
Midterm	Friday, October 10th, noon ET	Saturday, October 11th, 11:59 pm ET

- **Homework:** There are six homework assignments in this course. The objective of the homework is to gain experience with the analytics of the various methods discussed in class and reinforce the knowledge acquired from the lectures. We will aim to discuss the problems during our weekly office hours. Homework will be released as follows:

Assignment	Date Assigned (can be released earlier)	Due Date <i>(All due dates are on Sundays at 11:59 pm ET)</i>
Homework #1	August 20th	August 31st
Homework #2	August 31st	September 14th
Homework #3	September 7th	September 21nd
Homework #4	September 28th	October 12th
Homework #5	October 12th	October 26th
Homework #6	October 19th	November 2rd

- **Projects:** There are two projects in this course. Each project is worth 15% of the course grade. Each project will require careful time allocation to be completed on time (3 weeks). Weekly office hours will also provide enough support. Projects will be released as follows:

Assignment	Date assigned	Due Date <i>(All due dates are 11:59 pm ET)</i>
Project #1	September 14th	October 5th
Project #2	November 2rd	November 23th

- **Final Exam:** The final exam covers all the course topics comprehensively. It is a take-home to be taken over 48 hours in the last week of the course. There is no timer for the final exam except the 48 hours.

Assignment	Date assigned	Due Date
Final Exam	Friday December 5, 00:01 am ET	Saturday, December 6th, 11:59 pm ET

Submitting Assignments

The exams must be taken in Canvas during the dates and times described above. The homework assignments and projects must be completed and submitted in Canvas by the due date stated in the course schedule.

Assignment Due Dates

All assignments are due at the times listed in the course schedule. These times are subject to change, so please check back often. All times are in Atlanta time (ET). Please double-check your time zone, especially on November 3rd, when Daylight Saving Time ends.

Late and Make-up Work Policy

All homework and projects must be submitted by their due time. Submissions up to 24 hours late will be accepted without penalty, submissions that are more than 24 but less than 48 hours late will be accepted with a 50% penalty, and no submissions will be accepted if they are more than 48 hours late. **This policy does NOT apply on the midterm and the final exam.**

A student can begin taking a midterm/final test after the test "opens" in Canvas. A student's test completion is considered late if it occurs after the test's "closing" time in Canvas.

Students should submit their work on time. Students who submit late assume all the risks associated with technical, medical, and other problems.

No make-up work will be available, i.e., the student's grades will be based solely on the listed homework assignments, projects, midterm exams, and final exams, and no additional assignments will be created to help students improve their grades.

The only exceptions to these late and make-up work policies are:

- 1) Accommodations approved by the Dean of Students, e.g., because of illness and other emergencies; and
- 2) Accommodations that were discussed with and approved by the instructor; the need for these accommodations should be brought to the instructor's attention during the first week of the semester or as soon as possible if the need for accommodation was not known to the student at the beginning of the semester.

Technology Requirements and Skills

Knowledge Requirements

Students should be familiar with time-domain and frequency-domain circuit analysis, digital arithmetic, programming (any language), and the basics of embedded systems.

Technology Skills

To be successful in this course, students should

- Be able to edit, compile, debug, and run programs in any language,
- Be able to code an algorithm, debug the code, and obtain results – in any programming language.

Course Policies, Expectations & Guidelines

Communication Policy

- Questions should be submitted in the Ed Discussion. Questions about grading, discussing your solution to a still-open project, etc., should be submitted as a private post in Ed Discussion. Questions of a personal nature, e.g., about accommodations for disabilities and medical problems, should be submitted directly to the instructor via email using your university-assigned email account.
- Office hours will be held every **Tuesday, 7 pm ET until 8 pm ET**, using Zoom. However, for some weeks, the instructor may need to cancel or modify the office hours, and these cancellations and modifications will be communicated via announcements in Canvas.

Online Student Conduct and (N) Etiquette

Communicating appropriately in the online classroom can be challenging. To minimize this challenge, it is important to remember several points of "**internet etiquette.**"

That will smooth communication for both students and instructors:

1. Read first, Write later. Read the ENTIRE set of posts/comments on a discussion board before posting your reply to prevent repeating commentary or asking questions that have already been answered.
2. Avoid language that may come across as intense or offensive. Language can be easily misinterpreted in written and electronic communication. Review email and discussion board posts BEFORE submitting. Humor and sarcasm may be easily misinterpreted by your reader(s). Try to be as matter-of-fact and professional as possible.
3. Follow the language rules of the Internet. Do not write using all capital letters because it will appear as shouting. Also, the use of emoticons can be helpful when used to convey nonverbal feelings. ☺
4. Consider the privacy of others. Ask permission before giving out a classmate's email address or other information.
5. Keep attachments small. If it is necessary to send pictures, change the size to an acceptable 250kb or less (one free, web-based tool to try is picesize.com).
6. No inappropriate material. Do not forward virus warnings, chain letters, jokes, etc., to classmates or instructors. The sharing of pornographic material is forbidden.

NOTE: The instructor reserves the right to remove posts that are not collegial or do not meet the Online Student Conduct and Etiquette guidelines listed above.

University Use of Electronic Email

A university-assigned student e-mail account is the official university means of communication with all students at Georgia Institute of Technology. Students are responsible for all information sent to them via their university-assigned e-mail account. If a student chooses to forward information to their university e-mail account, he or she is responsible for all information, including attachments, sent to any other e-mail account. To stay updated with university information, students are expected to check their official university e-mail account and other electronic communications frequently and consistently. Recognizing that some communications may be time-critical, the university recommends that electronic communications be checked minimally twice a week.

Plagiarism & Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. All students enrolled at Georgia Tech and all its campuses are to perform their academic work according to standards set by faculty members, departments, schools, and colleges of the university; cheating and plagiarism constitute fraudulent misrepresentation for which no credit can be given and for which appropriate sanctions are warranted and will be applied. For information on Georgia Tech's Academic Honor Code, please visit <http://www.catalog.gatech.edu/policies/honor-code/> or <http://www.catalog.gatech.edu/rules/18/>.

Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or <http://disabilityservices.gatech.edu/> as soon as possible to make an appointment to discuss your unique needs and to obtain an accommodations letter. Please also e-mail me as soon as possible so we can schedule a time to discuss your learning needs.

Collaboration & Group Work

You are encouraged to form virtual groups to discuss topics covered in class. Such discussion can enhance learning and include clarifying questions about a topic or a project. However, individual work that you submit as part of an assessment and claim as yours must be yours.

All work for this class is to be done individually. You are strongly urged to familiarize yourself with the rules of the **GT Student Honor Code (Links to an external site.)**. **Specifically, the following is not allowed:**

- Copying, with or without modification, someone else's work when this work is not meant to be publicly accessible (e.g., a classmate's program or solution).
- Submission of material that is wholly or substantially identical to that created or published by another person or persons without adequate credit notations indicating authorship (*plagiarism*).
- Putting your projects on public GitHub. If a student copies your code/reports in the future, the student violates the honor code, but you will also be responsible for the violation.

Any public material you use (*open-source software, help from a text, substantial help from a friend*) should be acknowledged explicitly in anything you submit. If you doubt something is allowed, please check with the class Instructor or the TA.

Extensions, Late Assignments, & Re-Scheduled/Missed Exams

All homework and projects must be submitted by their due time. Submissions up to 24 hours late will be accepted without penalty, submissions that are more than 24 but less than 48 hours late will be accepted with a 50% penalty, and no submissions will be accepted if they are more than 48 hours late. This policy does not apply to exams.

Student-Faculty Expectations Agreement

At Georgia Tech, striving for an atmosphere of mutual respect, acknowledgment, and responsibility between faculty members and the student body is essential. See <http://www.catalog.gatech.edu/rules/22/> for an articulation of some basic expectations you can have of me and that I have of you. Ultimately, simple respect for knowledge, hard work, and cordial interactions will help build our desired environment. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.