Overview

The online certificate in computer systems engineering is designed for students and professionals seeking knowledge and skills in state-of-the-art parallel hardware architectures, parallel software programming, algorithms, and networking technologies. Stay current on rapidly advancing technology, and learn to problem solve for future challenges.

Focus your studies on three areas integral to computer systems engineering:

- Networking – how the internet works, protocols, standards
- Embedded systems – the underlying digital intelligence behind all the smart devices at the heart of the Internet of Things (IoT) revolution
- Computer architecture – chip, server, and datacenter design

What you learn

Students will work with a variety of hardware and software tools and analyze research to understand state of the art approaches to computer system design and future challenges the industry will face. The curriculum includes both individual and group project work. You will:

- Learn concepts and principles on state of the art networking.
- Learn advanced computer architecture and system design.
- Gain knowledge in computer security, including encryption techniques, secure software algorithms, and hardware security issues.
- Understand concepts in computer reliability, including soft error and aging reliability, dealing with variations, and cross-layer techniques for fault resilience.
- Learn how to analyze, model, and optimize hardware and software and how they integrate into the embedded system itself.

Curriculum

The curriculum for the computer systems engineering graduate certificate is customizable to your interests and educational goals. Select three courses from the list; at least one must be an ECE course.

- **ECE 554** – Computer Architecture (3 cr.) (spring)
- **ECE 658** – Internet Engineering (4 cr.) (fall)
- **ECE 561** – Hardware/Software Design of Embedded Systems (4 cr.) (fall)
- **ECE 661** – Advanced Topics in Embedded Systems (4 cr.) (spring)
- **CS 575** – Parallel Processing (4 cr.) (spring)
- **CS 545** – Machine Learning (4 cr.) (fall)
- **CS 556** – Computer Security (4 cr.) (spring)
- **CS 530** – Fault-Tolerant Computing (4 cr.) (spring)

Delivery

Online

Credits

10–12 credits

Tuition

$705-715 per credit
- Includes [Student Services](#)
- [Fees](#) assessed separately
- [Financial aid](#) is available; eligibility determined on an individual basis

Time frame

1 year

Completion requirements

Successful completion of 10–12 credits from the appropriate courses

More info

[online.colostate.edu/certificates/computer-systems-engineering](online.colostate.edu/certificates/computer-systems-engineering)

Contact

Maurice Kigada
Student Success Coach
[maurice.kigada@colostate.edu](mailto:maurice.kigada@colostate.edu)
(970) 492-4722
Application Deadlines
Fall semester: **July 1**       Spring semester: **December 1**

1. **Review Admission Requirements**
   This graduate certificate requires applicants to have the following, at a minimum:
   • Bachelor of Science from a regionally accredited institution in electrical engineering, computer science, or
     related field.
   • International students must hold degrees equivalent to U.S. bachelor's degrees. Bachelor of Science in
     Electrical Engineering Technology (BSEET) degrees are not accepted.

2. **Complete Online Application**
   Complete the [online graduate application](#) and pay the nonrefundable application processing fee (payable
   online). As soon as you have completed the required information, please submit your application. Your
   application will not be reviewed until it is complete and all required materials have been received.
   • Select “Computer Systems Engineering (Certificate) - Distance” when choosing the Program of Study. (Note:
     You must first select “Certificate” at the top.)

3. **Request Transcripts**
   Request one official transcript of all collegiate work completed from every institution attended, whether or not
   you received a degree from those institutions. Transcripts from Colorado State University are not required.
   Official transcripts can either be mailed in or sent as e-transcripts.
   Send e-transcripts to: gradadmissions@colostate.edu
   Send paper copies to:
   Graduate Admissions
   Colorado State University – Office of Admissions
   1062 Campus Delivery
   Fort Collins, CO 80523-1062

**Check Your Application Status**
View your [application status](#) at any time to ensure your application checklist is complete or to check on updates.
Once your complete application, including supporting materials, is received, the department admission committee
will review your application and notify you of their decision.

**International Students**
See [website](#) for test score and transcript requirements.