MASTER OF SCIENCE IN COMPUTER ENGINEERING, PLAN B

From self-driving cars to smart cities, we live in a hyper-connected world. As the smart thinkers behind today's smart devices and systems, computer engineers hold the key to understanding, advancing, and protecting the security of next generation technologies and data networks.

The Master of Science in Computer Engineering, Plan B produces professionals capable of applying in-depth knowledge and creativity to analyze, design, develop, and improve computer systems in technically demanding careers to drive innovation in virtually any field. Students interested in graduate work should refer to CSU's Graduate and Professional Bulletin (https://catalog.colostate.edu/general-catalog/graduate-bulletin/) and the Electrical and Computer Engineering Department (http://www.engr.colostate.edu/ece/) website.

Learning Objectives

Upon successful completion, students will be able to:

1. Identify, formulate, and solve advanced engineering problems using fundamental computer engineering principles, methodologies, and tools.
2. Apply in-depth knowledge and creativity in a variety of contexts to achieve a significant technical objective.
3. Demonstrate effective oral and written communication to convey technical concepts to both engineers and non-engineers.
4. Demonstrate professional behavior and understand the ethical, economic, environmental, and societal impacts of their work.

Requirements Effective Fall 2024

Code	Title	Credits
Select one group from the following:		
Group A: PORTFOLIO		
Regular Coursework (see list below) [1,2,3,4]		32
Portfolio Requirement [5]		
Group B: PROJECT		
Regular Coursework (see list below) [1,2,3,4]		27
ECE 695	Independent Study [6]	3
Program Total Credits:		**30-32**

A minimum of 30 credits are required to complete this program.

Regular Coursework

Code	Title	Credits
Any regular course approved by advisor and graduate committee		Var.
CS 4XX Any CS course at the 400-level (excluding courses numbered 482-499)		4
CS 5XX Any CS course at the 500-level (excluding courses numbered 582-599)		4
CS 6XX Any CS course at the 600-level (excluding courses numbered 682-699)		4
ECE 4XX Any ECE course at the 400-level (excluding courses numbered 482-499)		Var.
ECE 5XX Any ECE course at the 500-level (excluding courses numbered 582-599)		Var.
ECE 6XX Any ECE course at the 600-level (excluding courses numbered 682-699)		Var.
MATH 4XX Any MATH course at the 400-level (excluding courses numbered 482-499)		Var.
MATH 5XX Any MATH course at the 500-level (excluding courses numbered 582-599)		Var.
MATH 6XX Any MATH course at the 600-level (excluding courses numbered 682-699)		Var.
PH 4XX Any PH course at the 400-level (excluding courses numbered 482-499)		Var.
PH 5XX Any PH course at the 500-level (excluding courses numbered 582-599)		Var.
PH 6XX Any PH course at the 600-level (excluding courses numbered 682-699)		Var.
BIOM 533/CIVE 533	Biomolecular Tools for Engineers	3
ENGR 510	Engineering Optimization: Method/ Application	3
ENGR 520	Intelligent Decision Support Systems	3
ENGR 531	Engineering Risk Analysis	3
ENGR 533	Spaceflight and Biological Systems	3
ENGR 665	Stochastic Simulation in Engr Applications	3
GRAD 510	Fundamentals of High Performance Computing	3
GRAD 530	Introduction to Graduate Research	1
GRAD 544	Ethical Conduct of Research	1
GRAD 550	STEM Communication	1
MATH 550/ ENGR 550	Numerical Methods in Science and Engineering	3
MATH 569A/ DSCI 569A	Linear Algebra for Data Science: Matrices and Vectors Spaces	1
MATH 569B/ DSCI 569B	Linear Algebra for Data Science: Geometric Techniques for Data Reduction	1
MATH 569C/ DSCI 569C	Linear Algebra for Data Science: Matrix Factorizations and Transformations	1
MATH 569D/ DSCI 569D	Linear Algebra for Data Science: Theoretical Foundations	1
MECH 502	Advanced/Additive Manufacturing Engineering	3
MECH 513	Simulation Modeling and Experimentation	3
MECH 524	Principles of Dynamics	3
MECH 529	Advanced Mechanical Systems	3
MECH 531/BIOM 531	Materials Engineering	3
MECH 564	Fundamentals of Robot Mechanics and Controls	3
MECH 570/BIOM 570	Bioengineering	3
MECH 575	Solar and Alternative Energies	3
MECH 630	Biologically Inspired Robotics	3
NSCI 575/GRAD 575	Ethical Issues in Big Data Research	1
STAA 561	Probability with Applications	2
SYSE 530	Overview of Systems Engineering Processes	3

SYSE 532/ECE 532	Dynamics of Complex Engineering Systems	3
SYSE 536	Space Mission Analysis and Design	3
SYSE 541	Engineering Data Design and Visualization	3
SYSE 549	Secure Vehicle and Industrial Networking	3
SYSE 567	Systems Engineering Architecture	3
SYSE 569	Cybersecurity Awareness for Systems Engineers	3
SYSE 571	Analytics in Systems Engineering	3
SYSE 711	Ethics in Systems Engineering	1

[1] Courses not accepted as regular include all courses ending in the range -82 through -99.

[2] A maximum of 8 credit hours of 400-level undergraduate coursework will be counted to the degree. Remaining credits must be in 500-level or higher courses.

[3] A maximum of 12 credit hours outside of the ECE department will be counted to the degree.

[4] Computer Engineering students can choose from a wide range of topic areas for their courses. See the "Recommended Courses by Topic Area" document and the "Courses" link located on the following webpage: https://www.engr.colostate.edu/ece/graduates/admissions/

[5] ECE MS students will complete a Portfolio by attending five research-based Seminars offered or approved by Electrical and Computer Engineering. Some examples of these Seminars include, but are not limited to:

- Talks by visiting engineers, scientists, that are part of our ECE Seminar Series
- Attending a peer's MS Thesis defense or Ph.D. defense or Ph.D. exam
- For distance students, viewing IEEE (Institute of Electrical and Electronics Engineers) research based webinars available through their professional societies on their website.

Their Portfolio Final Exam requires them to answer two questions for each of the five seminars. These questions were designed by our faculty to ask the student to connect the content of the seminars to principles they learned in their MS courses. The Portfolio is graded by an ECE faculty member and counts as the student's final exam.

[6] Permission from the ECE department is required to register for ECE 695.

Requirements for All Graduate Degrees

For more information, please visit Requirements for All Graduate Degrees (https://catalog.colostate.edu/general-catalog/graduate-bulletin/graduate-study/procedures-requirements-all-degrees/) in the Graduate and Professional Bulletin (https://catalog.colostate.edu/general-catalog/graduate-bulletin/).

Summary of Procedures for the Master's and Doctoral Degrees

NOTE: Each semester the Graduate School publishes a schedule of deadlines. Deadlines are available on the Graduate School website (https://graduateschool.colostate.edu/deadline-dates/). Students should consult this schedule whenever they approach important steps in their careers.

Forms (https://graduateschool.colostate.edu/forms/) are available online.

Step	Due Date
1. Application for admission (online)	Six months before first registration
2. Diagnostic examination when required	Before first registration
3. Appointment of advisor	Before first registration
4. Selection of graduate committee	Before the time of fourth regular semester registration
5. Filing of program of study (GS Form 6)	Before the time of fourth regular semester registration
6. Preliminary examination (Ph.D. and PD)	Two terms prior to final examination
7. Report of preliminary examination (GS Form 16) - (Ph.D. and PD)	Within two working days after results are known
8. Changes in committee (GS Form 9A)	When change is made
9. Application for Graduation (GS Form 25)	Refer to published deadlines from the Graduate School Website
9a. Reapplication for Graduation (online)	Failure to graduate requires Reapplication for Graduation (online) for the next time term for which you are applying
10. Submit thesis or dissertation to committee	At least two weeks prior to the examination or at the discretion of the graduate committee
11. Final examination	Refer to published deadlines from the Graduate School Website
12. Report of final examination (GS Form 24)	Within two working days after results are known; refer to published deadlines from the Graduate School website
13. Submit a signed Thesis/Dissertation Submission Form (GS Form 30) to the Graduate School and Submit the Survey of Earned Doctorates (Ph.D. only) prior to submitting the electronic thesis/dissertation	Refer to published deadlines from the Graduate School website.
14. Submit the thesis/dissertation electronically	Refer to published deadlines from the Graduate School website
15. Graduation	Ceremony information is available from the Graduate School website