MASTER OF ENGINEERING, PLAN C, CHEMICAL ENGINEERING SPECIALIZATION

Master of Engineering, Plan C, Chemical Engineering Specialization is a coursework-based program in which students will learn from world-renowned experts how to identify, formulate and solve complex chemical engineering problems using principles of engineering, science, and mathematics. Our program equips students with a diverse skill set essential for the next generation of chemical engineering leaders in academia and industry. Students in the program have access to a wide range of graduate-level courses on the state of the art in chemical engineering technologies, including advanced polymeric materials, bioanalytical devices, biomedical science and engineering, systems biology, synthetic biology, and biomanufacturing.

Students interested in graduate work should refer to the Graduate and Professional Bulletin (http://catalog.colostate.edu/general-catalog/graduate-bulletin/).

Learning Objectives

Upon successful completion of this program, students will be able to:

1. Demonstrate technical mastery of the core chemical engineering disciplines of thermodynamics, transport phenomena, and chemical reaction engineering.
2. Competently and professionally communicate their work in both written and oral forms.
3. Identify, formulate, and solve complex chemical engineering problems by applying principles of engineering, science, and mathematics.
4. Assimilate information from other related fields of science and engineering to inform their chemical engineering practice and to expand the areas of application of their chemical engineering expertise.

Requirements
Effective Fall 2025

Code	Title	Credits
Core Courses:		**7-12**
Take the courses below in chemical engineering principles and mathematical modeling:		12
CBE 501	Chemical Engineering Thermodynamics	
CBE 502	Advanced Reactor Design	
CBE 503	Transport Phenomena Fundamentals	
CBE 521	Mathematical Modeling for Chemical Engineers	
OR the courses below in chemical and biological engineering principles:		7
CBE 500	Chem & Biological Engineering Fundamentals	
CBE 504/ BIOM 504	Fundamentals of Biochemical Engineering	
Advanced Statistics and Data Science [1]		**0-3**
BIOM 422	Quantitative Systems and Synthetic Biology	
BIOM 526/ ECE 526	Biological Physics	
BIOM 537/ ECE 537	Biomedical Signal Processing	
BIOM 570/ MECH 570	Bioengineering	
BIOM 576/ MECH 576	Quantitative Systems Physiology	
BZ 548	Theory of Population and Evolutionary Ecology	
BZ 562	Computational Approaches in Molecular Ecology	
CS 528/ECE 528	Embedded Systems and Machine Learning	
CS 535	Big Data	
CS 540	Artificial Intelligence	
CS 545	Machine Learning	
DSCI 445	Statistical Machine Learning	
DSCI 511	Genomics Data Analysis in Python	
DSCI 512	RNA-Sequencing Data Analysis	
ENGR 478	Applied Engineering Data Analytics	
ERHS 535	R Programming for Research	
HORT 579	Mass Spectrometry Omics-Methods and Analysis	
MIP 545	Microbial Metagenomics/Genomics Data Analysis	
MIP 570	Functional Genomics	
SOCR 545	Current Methods in Microbial Genomics	
STAR 511	Design and Data Analysis for Researchers I	
STAR 512	Design and Data Analysis for Researchers II	
STAT 520	Introduction to Probability Theory	
STAT 540	Data Analysis and Regression	
STAT 544/ ERHS 544	Biostatistical Methods for Quantitative Data	
STAT 547/ CIVE 547	Statistics for Environmental Monitoring	
STAT 560	Applied Multivariate Analysis	
SYSE 541	Engineering Data Design and Visualization	
Biomolecular Engineering Electives [1]		**0-6**
CBE 522/ BIOM 522	Bioseparation Processes	
CBE 524	Bioremediation	
CBE 540/CIVE 540	Advanced Biological Wastewater Processing	
CBE 560	Engineering of Protein Expression Systems	
CBE 570	Biomolecular Engineering/Synthetic Biology	
Biomolecular Engineering Laboratory [1]		**0-1**
CBE 505	Biochemical Engineering Laboratory	
Electives [2]		**13-18**

5XX - 7XX courses with the course following prefixes: CBE, BIOM, MSE, CIVE, ECE, MECH, SYSE, ENGR, AB, AHS, ANEQ, BC, BMS, BTEC, BZ, CM, CHEM, CS, DSCI, ECOL, ESS, ERHS, FSHN, FTEC, GEOL, GES, GRAD, HORT, LIFE, MATH, MIP, NB, PH, SOCR, STAR, STAA, STAT 2 [3]	7-18
4XX courses with the course following prefixes: BIOM, MSE, CIVE, ECE, MECH, SYSE, ENGR, AB, AHS, ANEQ, BC, BMS, BTEC, BZ, CM, CHEM, CS, DSCI, ECOL, ESS, ERHS, FSHN, FTEC, GEOL, GES, GRAD, HORT, LIFE, MATH, MIP, NB, PH, SOCR, STAR, STAA, STAT 2 [3]	0-6
Program Total Credits	**30**

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

[1] Students who choose option (2) in the core courses must take 3 credits in Advanced Statistics and Data Science, 6 credits in Biomolecular Engineering Electives, and 1 credit in Biomolecular Engineering Laboratory.

[2] For students who choose option (1) in the core courses, take 18 credits of electives, including any additional courses in the categories listed above.

For students who choose option (2) in the core courses, take 13 credits of electives, including any additional courses in the categories listed above

[3] Neither 400-level CBE courses, nor credit for CBE 693 may be used to satisfy the elective requirement for the M.E. program.

Requirements for All Graduate Degrees

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