

BME+EE Technical Electives

Technical Electives (TEs) are designed to provide additional breadth and depth in the Biomedical and partner major degrees.

BME-EE students must take 6 credits of BME TEs and 14 credits of ECE TEs chosen from the following lists.

Key:	
F - Fall	* Available Every Other Year (Even)
S - Spring	** Available Every Other Year (Odd)
SS - Summer	
See last page of this document for information on how to obtain course overrides	

- NOTE:**
1. Classes otherwise required for the degree are not allowed for TE credit.
 2. Course availability changes frequently. Please check with individual departments regarding course availability.
 3. *Crosslisted courses (e.g. BIOM/MECH 570) are in italics and must be taken as *BIOM* courses to count for BME Technical Elective credit.*

●BME+EE students must take 6 credits of BME TEs from the following list:

BME Technical Electives			
COURSE	NAME	TERM	CR
BC 351	Principles of Biochemistry	F, S, SS	4
BC 401	Comprehensive Biochemistry I	F	3
BC 403	Comprehensive Biochemistry II	S	3
BC 404	Comprehensive Biochemistry Laboratory	F,S	2
BC 411	Physical Biochemistry	F	4
BC 463	Molecular Genetics	F	3
BC 465	Molecular Regulation & Cell Function	S	3
BC 565	Molecular Regulation of Cell Function	S	4
BIOM 350A	Prosthetics in Ecuador (<i>DARS changes pending</i>)	SS	1 or 2
BIOM 421	Transport Phenomena in Biomedical Engineering	F	3
BIOM 422	Kinetics of Biomolecular and Cellular Systems	S	3
BIOM 441	Biomechanics and Biomaterials	F	3
BIOM 476 A-B	Biomedical Clinical Practicum (formerly BIOM 486)	F,S,SS	2 or 4
BIOM 495 ¹	BME Independent Study (3 credits max TE allowed of)	F,S,SS	1-6
<i>BIOM/CBE 504</i>	Fundamentals of Biochemical Engineering	S	3
<i>BIOM/ECE 518</i>	Biophotonics	F	3
<i>BIOM/CBE 522</i>	Bioseparation Processes	F	3
<i>BIOM/MECH 525</i>	Cell and Tissue Engineering	S	3
<i>BIOM/ECE 526</i>	Biological Physics	S	3
BIOM 527 (A-F)	Biosensors	F,S,SS	1
<i>BIOM/MECH 531</i>	Materials Engineering	S	3
<i>BIOM/CIVE 533</i>	Biomolecular Tools for Engineers	F	3
<i>BIOM/ECE 537</i>	Biomedical Signal Processing	S	3
<i>BIOM/CBE 543</i>	Membranes for Biotechnology and Biomedicine	F	3
<i>BIOM/MECH 570</i>	Bioengineering	F	3
<i>BIOM/MECH 573</i>	Structure and Function of Biomaterials	S	3
<i>BIOM/MECH 574</i>	Bio-Inspired Surfaces	S	3
<i>BIOM/MECH 576</i>	Quantitative Systems Physiology	S	4
<i>BIOM/MECH 578</i>	Musculoskeletal Biosolid Mechanics	F	3
BIOM 579/MECH 579	Cardiovascular Biomechanics	F	3
BMS 301	Human Gross Anatomy	F,S,SS	5
BMS 302	Laboratory in Principles in Physiology	F,S	2
BMS 310	Anatomy for the Health Professions (Online)	F, S, SS	4
BMS 325	Cellular Neurobiology	F	3
BMS 345	Functional Neuroanatomy	S	4
BMS 405	Nerve and Muscle-Toxins, Trauma and Disease	S	3
BMS 409	Human and Animal Reproductive Biology	F	3
BMS 420	Cardiopulmonary Physiology	F	3
BMS 430	Endocrinology	F	3
BMS 450	Pharmacology	S	3
BMS 500	Mammalian Physiology I	F	4
BMS 501	Mammalian Physiology II	S	4

BME Technical Electives (Continued)			
COURSE	NAME	TERM	CR
BZ 310	Cell Biology	F,S,SS	4
BZ 311	Developmental Biology	S,SS	4
BZ 350	Molecular and General Genetics	F,S,SS	4
BZ 476*/BZ 576	Genetics of Model Organisms	F	3
CBE 330	Process Simulation	F	3
CBE 505	Biochemical Engineering Laboratory	F	1
CHEM 334	Quantitative Analysis Laboratory	F, S	1
CHEM 335	Intro to Analytical Chemistry	F, S	3
CHEM 343	Modern Organic Chemistry II	F,S,SS	3
CHEM 344	Modern Organic Chemistry Laboratory	F,S,SS	2
CHEM 346	Organic Chemistry II	F,S	4
CHEM 433**	Clinical Chemistry	S	3
CHEM 539A-C	Principles of NMR and MRI	S	1
CM 501	Advanced Cell Biology	F	4
CM/NB 502	Techniques in Molecular & Cellular Biology	F	2
ECE/MECH 569*	Micro-Electro-Mechanical Devices	S	3
ERHS 450	Introduction to Radiation Biology	S	3
ERHS 502	Fundamentals of Toxicology	F	3
ERHS 510/VS 510	Cancer Biology	S	3
ERHS 540	Principles of Ergonomics	F	3
FSHN 470	Integrated Nutrition & Metabolism	F,S	3
HES 307	Biomechanical Principles of Human Movement	F,S,SS	4
HES 319	Neuromuscular Aspects of Human Movement	F,S	4
HES 403	Physiology of Exercise	F,S,SS	4
HES 476	Exercise and Chronic Disease	F,S,SS	3
MATH 455**	Mathematics in Biology and Medicine	F	3
MECH 543**	Biofluid Mechanics	S	3
MIP 300	General Microbiology	F,S,SS	3
MIP 302	General Microbiology Laboratory	F,S	2
MIP 342	Immunology	F,S	4
MIP 343	Immunology Laboratory	S	2
MIP 351	Medical Bacteriology	S	3
MIP 352	Medical Bacteriology Lab	S	3
MIP 420	Medical and Molecular Virology	F	4
MIP 436*	Industrial Microbiology	F	4
MIP 443	Microbial Physiology	S	4
MIP 450	Microbial Genetics	F	3
MIP/BSPM 576	Bioinformatics	F,S	3
NB 500/BMS 502	Readings in Cellular Neurobiology	F	1
NB 501	Cellular and Molecular Neurophysiology	F	2
NB/BMS 503	Developmental Neurobiology	S	3
NB/BMS 505	Neuronal Circuits, Systems and Behavior	S	3

¹ A maximum total of 3 credits of BIOM 476 and/or BIOM 495 may be applied towards BME technical elective degree requirements.

●BME+EE students must take 14 credits of ECE TEs from the following courses:

ECE Technical Electives

Course Number	Course Title	Terms	Credits
CS314	Software Engineering	F, S	3
CS320	Algorithms--Theory and Practice	F, S	3
CS356	Systems Security	F, S	3
CS370	Operating Systems	F, S	3
CS410	Introduction to Computer Graphics	F	4
CS414	Object-Oriented Design	F	4
CS420	Introduction to Analysis of Algorithms	F	4
CS430	Database Systems	S	4
CS440	Introduction to Artificial Intelligence	F	4
CS445	Introduction to Machine Learning	S	4
CS453	Introduction to Compiler Construction	S	4
CS455	Introduction to Distributed Systems	S	4
CS475	Parallel Programming	F	4
CS510	Image Computation	S	4
CS520	Analysis of Algorithms	S	4
CS530	Fault-Tolerant Computing	S	4
CS540	Artificial Intelligence	S	4
CS545	Machine Learning	F	4
CS553	Algorithmic Language Compilers	F	4
CS555	Distributed Systems	F	4
CS556	Computer Security	F	4
CS557	Advanced Networking	S	4

Course Number	Course Title	Terms	Credits
CS575	Parallel Processing	F	4
ECE4XX	Any ECE course at the 400 level	F, S	Varies
ECE495 A-C	Independent Study	F,S,SS	1-6
ECE5XX	Any ECE course at the 500 level	F,S	Varies
MATH417	Advanced Calculus I	F	3
MATH418	Advanced Calculus II	S	3
MATH419	Introduction to Complex Variables	F	3
MATH450	Intro to Numerical Analysis I	F	3
MATH451	Intro to Numerical Analysis II	S	3
MATH460	Information and Coding Theory	S	3
MATH466	Abstract Algebra I	F	3
MATH469	Linear Algebra II	S	3
MATH470	Euclidian and Non-Euclidian Geometry	S	3
MECH474	Introduction to Differential Geometry	F	3
MECH564	Fundamentals of Robot Mechanisms and Controls	S	3
PH315	Modern Physics Lab	S	2
PH425	Advanced Physics Laboratory	S	2
PH451	Intro to Quantum Mechanics I	F	3
PH452	Intro to Quantum Mechanics II	S	3
PH462	Statistical Physics	F	3
STAT421	Introduction to Stochastic Processes	S	3

² A maximum total of 3 credits of 495 Independent Study may be applied towards EE technical elective degree requirements.

To Request Overrides - Include your CSU ID and verification that you meet prerequisites. If you need an override for a non-engineering course, reach out to the prof and request override. For engineering courses, follow procedures as indicated below.

For 500-level BIOM courses, request permission from Sara.Mattern@colostate.edu (BME grad adviser) to request override.

For 500-level CBE courses, you should be able to register if you meet the pre-requisites. If you need an override, request from prof; forward permission to Claire.Lavelle@colostate.edu.

For 500-level ECE courses, you should be able to register if you meet the pre-requisites. If you need an override, request from prof; forward permission to Courtney.Johnsrud@colostate.edu

For CIVE courses, email your BME adviser with the reason you want the override (e.g. meet pre-reqs but are not in the major) and she will forward request to the department on your behalf.

For MECH courses, request approval via your BME adviser, who will forward to MECH on your behalf. Include your CSU ID#, whether you meet pre-reqs, and any extenuating circumstances/reason(s) for your request. If you do not have a

To request overrides for other courses (e.g. non-engr, 500-level or prereq override), email the course professor or the department teaching the course.