Directed electives are selected in consultation with your advisor. Any 300 or 400 level course in the College of Engineering & Science is acceptable as a directedelective. Although the offerings may vary from year to year, below is a list of directed electives – for which chemical engineering students meet the course prerequisites – that have been offered in recent years along with the typical quarters in which these courses are offered.

Additional 300 or 400 level courses not on the list may be taken as a directed elective (1) if the prereqs are met OR (2) subject to CMEN program approval.

*Course descriptions can be found in the LaTech catalog: http://www.latech.edu/registrar/bulletin/select.shtml

CHEMICAL ENGINEERING ELECTIVES

Course	Title	Pre/Co-reqs	Fall	Winter	Spring	Notes
CMEN 420	Nanosystems modeling	CHEM 251				
CMEN 435	Polymer science and engineering	CMEN 332 (co or prereq)				
CMEN 450X-001	Undergraduate research	-				X=A is 1 SCH, X=B is 2 SCH, and X=C is 3 SCH Can take 450A for 3 quarters for a total of 3 SCH.
CMEN 450C-002	Advanced transport phenomena	-				Advanced topics in heat, mass, and momentum transfer. Strongly recommended for students considering graduate study.
CMEN 455	Bioprocess engineering	MATH 242 & BISC 130				Includes viruses, vaccine production, beer production, wastewater treatment, pharmaceuticals.
CMEN 450C-002	Sustainable Chemical Processes	CHEM 251 & CMEN 413 (co or prereq)				

ECONOMIC / COST AND SIX SIGMA ELECTIVES

Course	Title	Pre/Co-reqs	Fall	Winter	Spring	Summer	Notes
INEN 300	Engineering economics	-				Hybrid	Good preparation for the economic analyses in Plant Design. Note that INEN 300 is **2 SCH**.
INEN 301	Industrial cost analysis	-					
INEN 400	Engineering statistics I	MATH 242					A six sigma green belt is earned by ≥B in both INEN 400 and 401. Or INEN 400 & EMGT 466
INEN 401	Engineering statistics II	INEN 400					
INEN 403	Des of Exp for Six Sigma	INEN 401					Students complete the requirement of the six sigma black belt certification by earning a grade of ≥B in INEN 400, 401, 403, and 420. INEN 401 Equivalent
INEN 420	Six Sigma Black Belt Project	INEN 403					
EMGT 466	Six Sigma & Qual Control						

CHEMISTRY ELECTIVES

Course	Title	Pre/Co-reqs	Fall	Winter	Spring	Notes
CHEM 311	Physical chemistry I	CHEM 252, MATH 242, PHYS 201				Chemistry minor by taking: - CHEM courses required for ChemE degree, - CHEM 254, and - 8 SCH of 300- or 400- level CHEM courses (e.g., CHEM 311- 314; CHEM 351-354; or CHEM 311, 313, 351, and 353).
CHEM 313	Physical chemistry I lab	CHEM 252, MATH 242, PHYS 201				
CHEM 312	Physical chemistry II	CHEM 311				
CHEM 314	Physical chemistry II lab	CHEM 311 & CHEM 312 (co-req)				
CHEM 351	Biochemistry I	CHEM 252				
CHEM 353	Biochemistry I lab	CHEM 351 (co-req)				
CHEM 352	Biochemistry II	CHEM 351				
CHEM 354	Biochemistry II lab	CHEM 353				
CHEM 466	Instrumental analysis	CHEM 312				4 SCH. Dr. Eklund will count CHEM 311 as pre-req for CMENs.

OTHER ELECTIVES

Course	Title	Pre/Co-reqs	Fall	Winter	Spring	Summer	Notes
BIEN 450C	Biomedical engineering entrepreneurship	-					
CVEN 314	Environmental Engineering	CHEM 102					
ENGR 454	Modern energy grand challenges	ENGR 220 and 222				online	
ENGR 494A	Eco-car leadership	Signature from Instructor					Can be taken x3 to earn 3 SCH.
INEN 315	Computer-aided engineering	ENGR 122					
INEN 406	Project management fundamentals	INEN 300					2 SCH
INEN 409	Work Design	INEN 300					
INEN 414	Industrial ergonomics	INEN 300					
INEN 416	Introduction to project management	INEN 300					
MATH 301	Functions and Modeling	MATH 242 + Signature					Mathematics minor by taking: - MATH courses required forChemE degree and - 9 SCH of 300- or 400- level MATH or STAT courses (otherthan STAT 402) - Note #1: No more than 6 SCHmay be in statistics - Note #2: A student must earn a grade of "C" or better in each course applied toward meeting the requirement of the minor.
MATH 302	Intro to Geometry and Math Foundations	MATH 242					
MATH 303	Intro to vector & tensor analysis	MATH 244					
MATH 307	Fundamentals of mathematics	MATH 243					
MATH 308	Introduction to linear algebra	MATH 243					
MATH 311	Discrete mathematics I	MATH 242					
MATH 313	Introductory numerical analysis	MATH 245 (or co-req)					
MATH 315	Financial mathematics	MATH 244 and INEN 300 and INEN 301					
MATH 401	College Geometry	MATH 243					
MATH 407	Partial differential equations	MATH 245					
MATH 414	Numerical analysis I	MATH 245					
MATH 415	Numerical analysis II	MATH 245					
MATH 420	Math methods for engineers & scientists	MATH 245					
MATH 470	Introduction to topology	MATH 244					
MEEN 478	Engineering acoustics	MATH 245					
MEEN 450C	Advanced Fluid Dynamics						
MEEN 434	Cryogenics	MEEN 332					
MSE 405	Nanotechnology principles	-					
MSE 406	Micro/nano material measurement & analysis	PHYS 202					Dr. Wang will count PHYS 201 as the prereq for ChemEs. See himfor a signature to enroll.
NSE 300	Intro to programming for engineers & scientists	ENGR 122 and MATH 243					
NSE 425	Nanofabrication by self-assembly	-					
PHYS 412	Solid state physics						
STAT 405	Statistical methods	MATH 242					Summer is on-campus or on-line.