ChBE CAREER ELECTIVES

Students must take 6 hours of classes aimed at enhancing their career objectives.[a] It is encouraged that these 6 hours be related to each other in some way, but any combination of these classes (from one or multiple categories) totaling 6 hours is acceptable. Tracks are provided as suggestions that lead to a focus in particular areas. These classes can be used towards a minor or double major at UA.

The courses listed below and on the next page are all pre-approved as CAREER electives; numbers in parentheses are the course credit hours. See the undergraduate catalog for course descriptions, pre- and co-requisites and frequency of offerings. Other classesmay be allowed to fill the CAREER electives slots but requires filling out the "career electives approval" form, signed by your COE advisor. Course numbers are accurate as of June 2021 but are subject to change.

BUSINESS TRACK	**CHEMISTRY TRACK[b]**	**RANDALL RESEARCH PROGRAM (RRS) / UNDERGRADUATE RESEARCH / HONORS CO-OP**
AC 210 (4) Intro to Accounting	*any chemistry > 200 level, including:*	
COM 121 (3) Hons. Critical Decision Making	CH 223 (4) Chemical Equilibria and Analyses	
COM 122 (3) Critical Decision Making	CH 340 (3) Elem. Physical Chemistry	BSC 398, 399[c,d] Biology Research
COM 123 (3) Public Speaking	CH 341 (3) Physical Chemistry I	RRS 101, 102[c,e] (4) Freshman Seminar
COM 352 (3) Business & Prof. Communication	CH 343 (1) Elem. Physical Chem. Lab	RRS 201[c,e] (3) Sophomore Seminar
CSM 425 (3) Cnsmr. Conflict Mediation, Mgmt.	CH 396, 398, 399[c,d] Research	CHE 491[c,d]CHE UG Research
CSM 427 (3) Cnsmr. Conflict Mediatn, Mgmt., Neg	CH 405 (3) Medicinal Chemistry	CHE 498, 499[c,d] Honors Res./Co-op
EC 110 (3) Principles of Microeconomics	CH 413 (4) Inorganic Chemistry	CH 396, 398, 399[c,d] Chem. Research
EC 111 (3) Principles of Macroeconomics	CH 424 (4) Instrumental Analysis	CH 497, 498, 499[c,d] Chem. Research
EC 308 (3) Intermediate Microecon.	CH 461 (3) Biochemistry I	UA 155, 156[c,d] Freshman Research and Creative Opps (Emerging Scholars)
EC 309 (3) Intermediate Macroecon.	CH 462 (3) Biochemistry II	
EN 319 (3) Technical Writing	CH 497, 498, 499[c,d] Research	PH 495, 496[c,d] Physics Research
FI 302 (3) Business Finance		GES 255 (3) Engineering Statistics I
GBA 171, 172 (1.5 ea) STEM MBA class		GES 257 (3) Engineering Statistics II
GBA 271, 272, 371, 372 (1.5 ea) STEM	**COMPUTER SCIENCE**	GES 400 (3) Engineering Statistics
GES 418 (3) Engr Management	CS 100 (4) Programming I	GES 451 (3) Matrix and Vector Analysis
MGT 300(3) Organizational Theory & Behavior	CS 201 Data Structures and Alg.	MA 237 (3) Intro Linear Alg and Matrix Theory
MKT 300 (3) Marketing	CS 202 (4) Intro to Internet	MA 257 (3) Linear Algebra
PHL 292 (3) Intro to Ethics	CS 101 (4) Programming II	MA 300 (3) Intro to Scientific Computing
PHL 221 (3) Honors Intro to Ethics	CS 200 (4) Programming III (Java)	MA 301 (3) Discrete Mathematics
ST 260 (3) Statistical Data Analysis		MA 343 (3) Applied Differential Equations II
GEOLOGY TRACK	**SCHOLARS PROGRAM (ONLY)[f]**	MA 355 (3) Theory of Probability
GEO 101 (4) The Dynamic Earth	CHE 512 (3) Polymer Materials Engr.	MA 410 (3) Numerical Linear Algebra
GEO 105 (4) Sustainable Earth	CHE 514 (3) Computer Methods in ChE	MA 451 (3) Mathematical Statistics w/ Applic. I
GEO 210 (4) Mineralogy	CHE 516 (3) Stem Cell Bioengineering	MA 452 (3) Mathematical Statistics w/ Applic II
GEO 306 (3) Hydrogeology	CHE 518 (3) Tissue Engineering	MA 485 (3) Intro to Complex Variables
	Honors (3) Electronic Materials	ME 349 (3) Engineering Analysis
	CHE 545 (3) Biochemical Engineering	
	(for other 500-level classes- use approval form)	
PRE-LAW	**MILITARY** (others, incl AFS, may be petitioned)	
AS 299 (3) Pre-Law Seminar	MIL 310 Small Unit Tactical Leadership	
LGS 200 (3) Legal Environ. of Business	MIL 311 Small Unit Leader Appl Lab I	
LGS 402 (3) Government and Business	MIL 320 Advanced Leadership Skills	
LGS 405 (3) International Business Law	MIL 321 Small Unit Leader Appl Lab II	

[a] ***Note:*** These 6 hours must be in addition to classes used for HI/SB, HU/L/FA, ENG, ADV SCI, BIOCHEM and CHE Electives. Refer to the undergraduate catalog for information about minors in each field, as well as pre- and co-requisites.

[b] For Dual CHE/CH BS degrees, the Career electives should be Chemistry courses (see Dual CHE/CHE Flowchart)

[c] Undergraduate Research/independent study classes can count for a maximum of 6 hours towards the BS ChBE degree.

[d] Most research classes have variable credit. Negotiate credit hours with your research director.

[e] A maximum of 6 hours of RRS research can be used to fill Career electives, Advanced Science elective (depending on topic), or CHE elective (if CBH project is with a ChBE professor).

[f] For BS/MS Scholars program, approved electives should be graduate level. Apply to the ChBE graduate coordinator.

THE FOLLOWING CLASSES ARE **NOT** APPROVED AS CAREER ELECTIVES: CS 102, CS 285, CSM 204, GES 100

ChBE CAREER ELECTIVES[a] (continued)

ENVIRONMENTAL ENGINEERING	PHYSICS	FUNDAMENTAL ENGINEERING (FE)
CE 271 (4) Intro to Glaciers (study abroad)	any PH > 200-level, including:	AEM 201 (3) Statics
CE 320 (3) Intro to Environmental Engr	PH 253 (3) Intro to Modern Physics	AEM 205 (3) Honors Statics
CE 378 (3) Water Resources Engr	PH 255 (1) Modern Physics Lab	AEM 250 (3) Mechanics of Materials I
CE 422 (3) Solid and Hazardous Waste Mgmt	PH 301 (3) Mechanics	AEM 264 (3) Dynamics
CE 424 (3) Water and Wastewater Treatment	PH 302 (3) Intermediate Mechanics	ECE 225 (4) Electric Circuits
CE 425 (3) Air Pollution Engineering	PH 331 (3) Electricity and Magnetism	ECE 320 (3) Fundamentals of Elec. Engr.
CE 470 (4) Water Resources in the Alps	PH 333 (3) Optics	GES 225 (3) Soc., Tech. & Envir. (Spain)
GY 101 (4) Atmosph Process/Patterns	PH 411 (3) Biophysics	MTE 271 (3) Engr Materials: Structure & Props
	PH 495, 496[c,d] Physics Research	MTE 487 (3) Corrosion Science
ADDITIONAL CHE ELECTIVES	**PRE-MED/PRE-HEALTH/BIOLOGY/BIOTECH**	
CHE 325[e] (1) CHE Honors Forum	AS 299 (3) Pre-Health Seminar	BSC 425 (2) Human Physiology Lab
CHE 412/413 (3) Polymer Materials Engr	BSC 115 (1) Biology I Laboratory	BSC 435 (4) Immunology
CHE 414/415 (3) Computers Methods in CHE	BSC 116 (3) Principles of Biology II	BSC 441 (3) Developmental Biology
CHE 416/417 (3) Stem Cell Bioengineering	BSC 117 (1) Biology II Laboratory	BSC 442 (4) Integrated Genomics
CHE 418/419 (3) Tissue Engineering	BSC 118[d] (4) Honors General Biology I	BSC 444 (3) General Virology
CHE 438/Hon. (3) Electronic Materials	BSC 120 (4) Honors General Biology II	BSC 449 (3) Endocrinology
CHE 445/446 (3) Biochemical Engr	BSC 215 (4) Human Anatomy &Physiology I	BSC 450 (3) Fundamentals of Biochem
CHE 492 (3) new elective offerings	BSC 216(4) Human Anatomy &Physiology II	BSC 451 (3) Molecular Biology
CHE 497 (3) Honors Co-Op/Internships	BSC 242 (4) Microbiology and Man	BSC 465 (3) Principles of Toxicology
FOREIGN LANGUAGES [b]	BSC 300 (3) Cell Biology	BSC 469 (3) Histology of Vertebrates
CHI 101, 102 (4) Elementary Chinese 1 & 2	BSC 310 (3) Microbiology	BSC 496 (3) Bioremediation
CHI 201, 202 (3) Intermediate Chinese 1 & 2	BSC 312 (2) Microbiology Lab	CHS 330 (3) Issues in Contemp. Medicine
FR 101, 102, 103 (4) Intro. French 1 & 2	BSC 315 (3) Genetics	CHS 425 (3) Biostatistics
FR 201, 202 (3) Intermediate French 1 & 2	BSC 385 (3) General Ecology	CHE 225, 325, 425[e] (1) CHE Honors Forum
GN 101, 102,103 (4) Intro German 1 & 2	BSC 398, 399[f] Biology Research	CHE 418 (3) Tissue Engineering
GN 201, 202 (3) Intermediate German 1 & 2	BSC 424 (3) Human Physiology	PHL 223 (3) Medical Ethics
IHP 105[c] (3) Hon Culture & Human Experience		UH 330 (3) Intro to Clinical Medicine
IHP 155[c] (3) Hon Culture & Human Experience		
IT 101, 102 (4) Intro Italian 1 & 2		
IT 201, 202 (3) Intermediate Italian 1 & 2		
JA 101, 102 (4) Elementary Japanese 1 & 2		
JA 201,202 (3) Intermediate Japanese 1 & 2		
SP 101, 102, 103 (4) Intro Spanish 1 & 2		
SP 201, 202 (3) Intermediate Spanish 1 & 2		

[a] ***Note:*** These 6 hours must be in addition to classes used for HI/SB, HU/L/FA, ENG, ADV SCI, BIOCHEM and CHE Electives. Refer to the undergraduate catalog for information about minors in each field, as well as pre- and co-requisites.

[b] Other foreign languages are approved- see your advisor.

[c] One of these two classes may count, but not both.

[d] BSC 118 can be used to count for 3 hours of BSC 114; the additional hour of lab can be used for Career Electives; however, on DegreeWorks, it will not appear explicitly as a Career elective (instead, the required hours for Career electives will be decreased to 5 if you take BSC 118).

[e] Students can take CHE honors forum more than once for credits. Topics and instructors rotate each semester.

[f] Undergraduate Research/independent study classes can count for a maximum of 6 hours towards the BS ChBE degree. Most research classes have variable credit. Negotiate credit hours with your research director.