

DEPARTMENT OF CHEMICAL ENGINEERING  
UNIVERSITY OF NORTH DAKOTA  
ELECTIVES FOR BSChE DEGREE -- EFFECTIVE FALL SEMESTER 2005

**Advanced Chemical Science Elective\*** (six credits minimum) -- Choose from:

Chem 333 - Introduction to Environmental, Clinical, & Forensic Chemical Analysis (4)	ChE 507 – Advanced Unit Operations (3)
Chem 342 - Organic Chemistry II (4)	ChE 509 – Advanced Chemical Engineering Thermodynamics (3)
Chem 342L - Organic Chemistry II Lab (1)	ChE 511 – Advanced Chemical Engineering Kinetics (3)
Chem 454 - Inorganic Chemistry (3)	ChE 512 – Advanced Separations (3)
Chem 455 - Spectroscopy and Structure (3)	ChE 535 – Metallic Corrosion & Polymer Degredation (3)
Chem 461/461L - Instrumental Analysis/Lab (5/1)	ChE 593 – Polymer Reaction Engineering (3)
Chem 463 - Advanced Synthesis Lab (3)	Biol 367 - Cytology (3)
Chem 464 - Physical Chemistry I (3)	Biol 450 - Molecular Genetics (3)
Chem 466/467 – Survey of Physical Chemistry/Laboratory (4/1)	Biol 551 - Biochemical Genetics (3)
Chem 520 - Advanced Organic Chemistry I (3)	BIMD 500 – Cellular and Molecular Foundations of Biomedical Science (7)
BiCh 301 - Biochemistry Lecture (3)	
MBio 302 - General Microbiology Lecture (2)	

Other courses offered by the Department of Chemical Engineering, the Department of Chemistry, the Department of Biochemistry and Molecular Biology and the Department of Microbiology and Immunology must receive approval of student's advisor prior to registration.

**Engineering Science Elective\*** (three credits minimum) -- Choose from:

ChE 435 – Materials and Corrosion (3)	Engr 203 Mechanics of Materials (3)
Engr 202 - Dynamics (3)	ME 301- Materials Science (3)

**Technical Elective I** (three credits minimum) -- Choose from:

All courses acceptable for Advanced Chemical Science	Math -- any regularly offered 300- or 400-level course having Math 166 or higher as a prerequisite
AtSc -- any regularly offered 300- or 400-level course having Math 166 or higher or Phys 252 or higher as a prerequisite	ME -- any regularly offered 300- or 400-level course
ChE – any regularly offered 400- or 500-level course not required for the BSChE degree	Phys -- any regularly offered 300- or 400-level course having Phys 252 or higher as a prerequisite
CE -- any regularly offered 300- or 400-level course	Biol 315 Genetics (3)
CSci -- any regularly offered 300- or 400-level course	Biol 341/341L Cell Biology/Laboratory (3/1)
EE -- any regularly offered 300- or 400-level course	Biol 369/369L Histology/Lab (2/2)
Engr -- any regularly offered 500 level course	CLS 394 Clinical Microbiology (2)
Geol/GeoE -- any regularly offered 300- or 400- level course	CLS 487 Medical Mycology (1)
Mgmt/Mrkt/Finance -- any regularly offered 400- level course	Entr 385 - Venture Initiation (3)
	N&D 441 Advanced Nutrition (4)
	OSEH 440 Industrial Safety (3)
	ENTR 387 – Venture Growth (3)

Other courses must receive approval of student's advisor prior to registration.

\*Courses selected to meet this elective must be taken for a letter grade (except those offered only on S/U basis).

**Technical Elective II** (six credits minimum) -- Choose from:

All courses acceptable for Technical Elective I	CLS 234/234L – Human Parasitology/Lab (2/1)
A&S 351 - Intro to Law and Legal Studies (3)	CJ 302 – Women, Crime, and Criminal Justice
Acct 315 - Business in the Legal Environment (3)	CJ 330 – Criminological Theory (3)
Acct 316 - Business Law (3)	CJ 350 – Correctional Alternatives (3)
Acct 416 - Advanced Business Law (3)	CJ 351 – Police Administration (3)
Biol 150/150L - General Biology I/Lab (3/1)	CJ 353 – Law for Criminal Justice Systems (3)

Biol 151/151L - General Biology II/Lab (3/1)	Econ 303 - Money and Banking (3)
Biol 332 – General Ecology (3)	Econ 305 - Principles of Banking (3)
Biol 433 – Aquatic Ecology (3)	Econ 308 - Intermediate Microeconomic Theory (3)
ChE 397 - Cooperative Education (1-6)	Mgmt 301 - Production Management (3)
Econ 309 - Intermediate Macroeconomic Theory and Policy (3)	Mgmt 305 - Managerial Concepts (3)
Econ 311 - Business Cycles and Forecasting (3)	Mgmt 309 - Quantitative Approaches to Management Decisions (3)
Econ 330 - Business and Economic History (3)	Mgmt 310 - Organizational Behavior (3)
Econ 331 - Comparative Economic Systems (3)	Mrkt 301 - Principles of Marketing (3)
Econ 338 - International Economics (3)	Mrkt 305 – Marketing Foundations (3)
Econ 355 - Government Regulation of Business (3)	Mrkt 325 - International Marketing (3)
Econ 400 - History of Economic Thought (3)	MBio 202/202L – Introduction to Microbiology/Laboratory (2/2)
Econ 438 - International Money and Finance (3)	OSEH 305 – Fire Safety (2)
Entr 301 - Accounting and Financial Concepts for Entrepreneurs (3)	OSEH 365 – Radiation (2)
Entr 302 - Marketing and Management Concepts for Entrepreneurs (3)	OSEH 385 – Instrumentation (2)
Fin 310 - Principles of Financial Management (3)	OSEH 395 – Hazardous Materials Management (3)
Fin 360 - Capital Market Financing and Investment Strategies (3)	OSEH 405 – Industrial Hygiene (3)
Fin 430 - International Financial Management (3)	OSEH 435 – Risk Management (3)
IT 300 – Technology and Society (3)	Phy 301 – Mechanics of Human Physiology (4)
Mgmt 300 - Principles of Management (3)	PSci 432 - Public Policy Making Processes (3)
	SpSt - any regularly offered 300- or 400-level course

**Cultural Electives (three credits minimum)** – Choose from:

Anth 171 - Introduction to Cultural Anthropology (3) [SS]	Phil 215 – Contemporary Moral Issues (3) [A&H]
Com 102 - Communication and the Human Community (3) [SS]	Pols 318 - American Political Thought (3) [SS]
Com 103 - Information, Technology, and Social Change (3) [SS]	Pols 432 - Public Policy Making Process (3) [SS]
ChE 340 -The Role of Engineers and Applied Scientists in a Global Society	Rels 203 - World Religions (3) [SS]
Geog 161- World Regional Geography (3) [SS]	Soc 250 - Diversity in America (3) [SS]
	Soc 306 - Social Change (3)
	IT 300 - Technology and Society (3) [M,S&T]

Courses marked [A&H] meet the University's Arts & Humanities GER. Courses marked [SS] meet the University's Social Science GER. Unmarked courses do not meet GER.

Other courses must receive approval of student's advisor prior to registration.

### **Minors**

Requirements for the BSChE degree include a number of credits of both chemistry and mathematics. It is possible, using the required courses as a base, to meet the requirements for a minor in chemistry, mathematics or statistics using courses that meet elective requirements in the BSChE program.

**Minor in chemistry** -- requires a minimum of 20 semester credits including one year of general/inorganic chemistry with laboratory, a semester of analytical chemistry with laboratory and one year of organic chemistry with laboratory. The BSChE degree requires: Chem 121/121L and 122/122L – General Chemistry I and II with laboratory (8 cr); Chem 341/341L – Organic Chemistry I with laboratory (5 cr); and Chem 465 – Physical Chemistry II (3 cr). The requirements for a minor in chemistry can be met by completing either Chem 330 – Quantitative Analysis (4 cr) or Chem 333 – Introductory Environmental, Clinical, and Forensic Chemical Analysis (4 cr) and either Chem 342/342L – Organic Chemistry II with laboratory (5 cr) or BiCh 301 – Biochemistry Lecture.

**Minor in mathematics** -- requires 20 semester credits including Math 165, 166 and 265 – Calculus I, II and III (which are required for the BSChE). All electives must be chosen from courses numbered 208 and above, not including 277, 377, or 477.

**Minor in statistics** -- Plan A requires Math 165, 166 and 265 – Calculus I, II and III (which are required for the BSChE); Math 421, 422 – Statistical Theory I, II; plus three credits from a list that includes ChE 515 – Design of Engineering Experiments.