

**Departmental Electives: Civil Engineering,  
Civil Engineering Concentration**  
Effective Fall 2017

**Department of Civil & Environmental Engineering  
College of Engineering**

**SCIENCE TECHNICAL ELECTIVES** (take 4 credits)

*These courses will only fulfill the "Science Technical Elective" and cannot be used to fulfill the requirement for either the "Engineering Technical Elective" or the additional "Technical Elective" noted below.*

GEOL120, or 122, or 124, and GEOL121	Exploring Earth, or Geol. Of Environment, or Geol. Of Natural Resources, and Introductory Geology Lab	3 cr., 1 Lab cr.
GEOL150	Physical Geology for Scientists and Engineers	4 cr.
LIFE102	Attributes of Living Systems	4 cr.
BZ110 and BZ111	Principles of Animal Biology and Principles of Animal Biology Lab	3 cr., 1 Lab cr.
BZ120	Principles of Plant Biology	4 cr.

**ENGINEERING TECH ELECTIVES** (take at least 3 credits)

CIVE 305	Intermediate AutoCAD	3 cr.
CIVE 330	Ecological Engineering	3 cr.
CIVE 413	Environmental River Mechanics	3 cr.
CIVE 423	Groundwater Engineering	3 cr.
CIVE 424	Modern Gas and Oil	3 cr.
CIVE 437	Wastewater Treatment Fac. Design	3 cr.
CIVE 439	Environmental Engineering Chemical Concepts	3 cr.
CIVE 440	Nonpoint Source Pollution	3 cr.
CIVE 442	Air Quality Engineering	3 cr.
CIVE 455	Applications in Geotechnical Engineering	3 cr.
CIVE 502	Fluid Mechanics	3 cr.
CIVE 504	Wind Engineering	3 cr.
CIVE 506	Wind Effects on Structures	3 cr.
CIVE 507	Transportation Engineering	3 cr.
CIVE 508	Bridge Engineering	3 cr.
CIVE 510	Applied Hydraulic System Design	3 cr.
CIVE 511	Coastal Engineering	3 cr.
CIVE 512	Irrigation Systems Design	3 cr.
CIVE 514	Hydraulic Structures/Systems	3 cr.
CIVE 519	Irrigation Water Management	3 cr.
CIVE 520	Physical Hydrology	3 cr.
CIVE 521	Hydrometry	3 cr.
CIVE 522	Engineering Hydrology	3 cr.
CIVE 524	Modeling Watershed Hydrology	3 cr.
CIVE 525	Water Engineering: International Development	3 cr.
CIVE 531	Groundwater Hydrology	3 cr.
CIVE 532	Wells and Pumps	3 cr.
CIVE 533	Biomolecular Tools for Engineers	3 cr.
CIVE 537	Residuals Management	3 cr.
CIVE 538	Aqueous Chemistry	3 cr.
CIVE 539	Water and Wastewater Analysis	3 cr.
CIVE 540	Advanced Biological Wastewater Processing	3 cr.
CIVE 541	Environmental Unit Operations Treatment/Design	3 cr.
CIVE 544	Water Resources Planning and Management	3 cr.

CIVE 546	Water Resources System Analysis	3 cr.
CIVE 547	Statistics for Environmental Monitoring	3 cr.
CIVE 549	Drainage and Wetlands Engineering	3 cr.
CIVE 550	Foundation Engineering	3 cr.
ENGR 550	Numerical Methods in Science and Engineering	3 cr.
CIVE 553	Slope Stability and Retaining Structures	3 cr.
CIVE 556	Seepage and Earth Dams	3 cr.
CIVE 558	Containment Systems for Waste Disposal	3 cr.
CIVE 559	Special Topics in Geotechnical Engineering	3 cr.
CIVE 560	Advanced Mechanics of Materials	3 cr.
CIVE 561	Advanced Steel Behavior and Design	3 cr.
CIVE 562	Fundamentals of Vibrations	3 cr.
CIVE 563	Structural Reliability Theory	3 cr.
CIVE 565	Finite Element Method	3 cr.
CIVE 566	Intermediate Structural Analysis	3 cr.
CIVE 567	Advanced Concrete Design	3 cr.
CIVE 568	Design of Masonry and Wood Structures	3 cr.
CIVE 571	Pipeline Engineering and Hydraulics	3 cr.
CIVE 572	Analysis of Urban Water Systems	3 cr.
CIVE 573	Urban Stormwater Management	3 cr.
CIVE 574	Civil Engineering Project Management	3 cr.
CIVE 575	Sustainable Water and Waste Management	3 cr.
CIVE 576	Engineering Applications of GIS & GPS	3 cr.
CIVE 577	GIS in Civil and Environmental Engineering	3 cr.
CIVE 578	Infrastructure and Utility Management	3 cr.

**TECHNICAL ELECTIVES** (only 3 credits of a 4 or 5 credit course will be applied toward a Technical Elective from this list)

*Students may select from the list of courses below or they may select an additional course from the above "List of Approved Engineering Technical Electives" to fulfill this requirement.*

AA 301	Astrophysics I	5 cr.
BC 351	Principles of Biochemistry	4 cr.
CHEM 245	Fundamentals of Organic Chemistry	4 cr.
CHEM 345	Organic Chemistry	4 cr.
*°CON 365	Construction Estimating II	3 cr.
*°CON 367	Construction Contracts and Project Administration	3 cr.
*CON 370	Asphalt Pavement Materials & Construction	3 cr.
*°CON 461	Construction Project Scheduling & Cost Control	3 cr.
ERHS 446	Environmental Toxicology	3 cr.
+*FIN 305	Fundamentals of Finance	3 cr.
GEOL 442	Applied Geophysics	4 cr.
LIFE 320	Ecology	3 cr.
MATH 332	Partial Differential Equations	3 cr.
MATH 369	Linear Algebra	3 cr.
+*MGT 305	Fundamentals of Management	3 cr.
MIP 300	General Microbiology	3 cr.
+*MKT 305	Fundamentals of Marketing	3 cr.
NR 319	Geospatial Applications in Natural Resources	4 cr.
NR 322	Introduction to Geographic Information Systems	4 cr.
NR 323	Remote Sensing and Image Interpretation	3 cr.
WR 304	Sustainable Watersheds	3 cr.

**\*These courses may require approval from the respective Department/College to enroll.**

**°These course count towards the Construction Management Minor.**

***+At most, one course in business management or economics at the 300-level or above may be counted towards the technical elective requirement.***