

Descriptions — Chemistry of Courses

998. Physical Chemistry Seminar
Fall, Spring. 1(1-0) A student may earn a maximum of 3 credits in all enrollments for this course. R: Open only to graduate students in Chemistry. Advances in physical chemistry reported by graduate students.

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 20 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to doctoral students in Chemistry and Chemical Physics.

CHINESE

CHS

Department of Linguistics and Germanic, Slavic, Asian and African Languages College of Arts and Letters

101. Elementary Chinese I
Fall. 5(5-0)

Pronunciation, writing system, and basic vocabulary and sentence patterns, with emphasis on conversation.

102. Elementary Chinese II
Spring. 5(5-0)

P: CHS 101 or approval of department. Further work on conversation, character writing, and comprehension, with increasing emphasis on vocabulary building and grammar.

201. Second-Year Chinese I
Fall. 5(5-1)

P: CHS 102 or approval of department. Intermediate-level work on conversation, comprehension, and grammar. Practice in composition.

202. Second-Year Chinese II
Spring. 5(5-0)

P: CHS 201 or approval of department. Further intermediate-level work on skills in conversation, comprehension, and grammar. Continued practice in composition.

301. Third-Year Chinese I
Fall. 4(4-0)

P: CHS 202. Advanced-level work on speaking, listening comprehension, reading, and writing skills, based on materials of cultural interest.

302. Third-Year Chinese II
Spring. 4(4-0)

P: CHS 301. Advanced-level work on speaking, listening comprehension, reading, and writing skills, based on materials of cultural interest.

350. Studies in the Chinese Language
Spring. 3(3-0)

P: CHS 201 or approval of department. Grammatical structures of modern Chinese. Grammar review, sound system, word formation, sentence and discourse structures, historical evolution of the Chinese language, dialects, sociolinguistics.

401. Fourth-Year Chinese I
Fall. 3(3-0)

P: CHS 302. Reading, discussion, and writing of advanced materials, including classical texts of broad cultural interest.

402. Fourth-Year Chinese II
Spring. 3(3-0)

P: CHS 401. Further reading, discussion and writing based on original materials, including classical texts of broad cultural interest.

499. Senior Thesis Research

Fall, Spring. 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course.

R: Approval of department.

An individual research project supervised by a faculty member that demonstrates the student's ability to do independent research and submit or present a major paper.

CIVIL ENGINEERING

CE

Department of Civil and Environmental Engineering College of Engineering

271. Engineering Surveying
Fall. 4(3-3)

P: MTH 120.

Application of surveying and error analysis to civil engineering problems. Earth work. Calculations. Layout and management of construction sites.

280. Introduction to Environmental Engineering
Fall, Spring. 3(3-0)

P: CEM 141 or CEM 151, MTH 132, CPS 101 or CPS 131.

Elements of hydrology. Groundwater and surface water supply and contamination. Treatment systems for drinking water, wastewater, air, and solid and hazardous waste. Introduction to noise and radiation pollution.

305. Structural Analysis
Fall, Spring. 3(3-0)

P: MSM 211. R: Open only to Civil Engineering majors. Determinate and indeterminate plane structures. Linearity, stability, determinacy. Virtual-work calculation of forces and displacements. Flexibility and stiffness methods in plane structures.

312. Soil Mechanics
Fall, Spring. 3(2-3)

P: MSM 211. R: Open only to Civil Engineering and Biosystems Engineering majors. Completion of Tier I writing requirement.

Engineering properties of soil and their measurement. Effective-stress concept. Permeability and seepage. Compaction. Consolidation, shear strength and stress-strain behavior.

321. Introduction to Fluid Mechanics
Fall, Spring. 4(3-2)

P: MTH 235 or concurrently. R: Open only to Civil Engineering and Biosystems Engineering majors. Completion of Tier I writing requirement. Not open to students with credit in ME 332.

Fluid properties, fluid statics, fluids in motion. Conservation of mass, energy and momentum. Dimensional analysis and similitude. Internal and external flows. Applications.

337. Civil Engineering Materials I
Fall, Spring. 4(3-3)

P: MSM 211 or concurrently. R: Open only to Civil Engineering majors.

Common civil engineering construction and paving materials: aggregates, inorganic cements, asphalts, concretes, wood and steel. Composition, structure, physical and mechanical properties, tests, and production mix design.

400. Structural Mechanics
Fall. 3(3-0)

P: CE 305. R: Open only to Civil Engineering majors. Matrix methods of structural analysis. Flexibility method. Direct stiffness method for plane structures. Elastic supports, inclined supports, member releases and non-prismatic members. Application software.

405. Design of Steel Structures
Fall. 3(3-0)

P: CE 305. R: Open only to Civil Engineering majors. Design of steel beams, columns, tension members and connections. Stability and plastic strength.

406. Design of Concrete Structures
Spring. 3(3-0)

P: CE 305, CE 337. R: Open only to Civil Engineering majors. Design of reinforced concrete beams, slabs, columns and footings.

418. Geotechnical Engineering
Fall. 4(4-0)

P: CE 312. R: Open only to Civil Engineering majors. Shallow foundation design including bearing capacity, stress distribution, and settlement analysis. Pile foundations. Design of retaining structures including rigid walls, braced excavations, and sheet-pile walls. Stability of slopes and embankments.

421. Engineering Hydrology
Fall. 3(3-0)

P: STT 351; CE 321 or concurrently. R: Open only to College of Engineering, College of Natural Science, and Crop and Soil Sciences majors.

Hydrologic cycle, streamflow, precipitation, evapotranspiration, infiltration, groundwater. Quantitative methods of analysis: probability, unit hydrograph, routing, and flow nets. Groundwater supply development, well flows.

422. Applied Hydraulics
Spring. 3(2-2)

P: CE 321 or ME 332. R: Open only to Civil Engineering, Mechanical Engineering, and Biosystems Engineering majors.

Fundamentals of open-channel flow. Rapidly and gradually varied nonuniform flow analysis. Confined flows past submerged bodies, in pipe networks, and in turbo machinery. Design applications.

431. Pavement Design and Analysis I
Fall. 4(4-0)

P: CE 312, CE 337. R: Open only to Civil Engineering majors.

Highway and airfield pavement structural design. Performance measures. Failure mechanisms, popular thickness design procedures, and design considerations for surface friction, pavement joints, and drainage. Design of rehabilitation alternatives, design of overlays.

441. Highway Operations
Fall. 3(3-0)

P: STT 351. R: Open only to Civil Engineering majors. Driver and vehicle characteristics affecting traffic flow. Traffic flow density, highway speed and capacity. Signal control of intersections and networks. Risk management and liability.

442. Airport Planning and Design
Fall. 3(3-0)

R: Open only to Civil Engineering majors. Components of the airport system including ground access facilities, aircraft characteristics, air traffic control, airport configuration, capacity analysis.

443. Advanced Airport Systems Design
Spring. 3(3-0)

P: CE 442. R: Open only to Civil Engineering majors. Analysis and design of airport systems using computer models. Design parameters, demand analysis. Runway orientation and capacity, airside delay, vehicle processing. Passenger processing.
SA: CE 842