CHINESE

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

998. Physical Chemistry Seminar
Fall, Spring. 1-0-0 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.
QA: CHS 998

999. Doctoral Dissertation Research
Fall, Spring, Seminar. 1 to 20 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
R: Open only to graduate students in Chemistry.
QA: CEM 999

CIVIL ENGINEERING

Department of Civil Engineering
College of Engineering

271. Engineering Surveying
Fall, Spring. 4(3-3)
P: CHS 101
Application of surveying and error analysis to civil engineering problems. Earth work. Calculations. Layout and management of construction sites.
QP: MTH 112 QA: CE 252, CE 251
290. Introduction to Environmental Engineering
Fall, Spring. 3(3-0)
P: CEM 141 or CEM 151, MTH 132, CPS 130 or CPS 131
Elements of hydrology. Groundwater and surface water survey and contamination. Treatment systems for drinking water, wastewater, air, and solid and hazardous waste. Introduction to noise and radiation pollution.
QP: CEM 141, CEM 151, MTH 112, CPS 122 QA: CE 280
305. Structural Analysis
Fall, Spring. 3(3-0)
P: MSM 211, CE 390 or concurrently. R: Open only to Civil Engineering majors.
Determinate and indeterminate plane structures. Linearity, stability, determinacy. Virtual-work calculations of forces and displacements. Flexibility and stiffness methods in plane structures.
QP: MTH 211 QA: CE 305, CE 306
312. Soil Mechanics
Fall, Spring. 3(3-3)
P: MSM 211, B: Open only to Civil Engineering and Agricultural Engineering majors.
QP: MTH 211 QA: CE 312
321. Introduction to Fluid Mechanics
Fall, Spring. 4(3-3)
P: MSM 306 or concurrently. R: Open only to Civil Engineering and Agricultural Engineering majors. Not open to students with credit in ME 352.
P: MTH 310, MSM 306 QA: CE 321
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, asphalt, concrete, steel and wood. Composition, structure, physical and mechanical properties, tests, and production mix design.
P: MTH 211 QA: CE 346
346. Transportation
Fall, Spring. 3(3-0)
P: MTH 133, R: Open only to Civil Engineering, Engineering Arts, and Urban Planning students. Planning, design, and evaluation of transportation systems. Transportation demand, capacity, delay, and service quality. Elements of geometric design.
P: MTH 113 QA: CE 346
of Courses

829. Fluid Transients
Spring of even-numbered years. 3(3-0)
Application of unsteady flow concepts and wave mechanics to hydraulic engineering; method of characteristics, surges and hammer in piping systems, resonance phenomena.

QP: CE 321 QA: CE 829

830. Pavement Design and Analysis
Spring, 3(3-0)
Theoretical models for analysis of pavement systems. Evaluation and application of current design practices related to elastic and plastic theory. Formulation of improved design procedures.

QP: CE 484 QA: CE 840

835. Engineering Management of Pavement Networks
Spring of odd-numbered years. 3(3-0)
Theoretical and statistical analysis of pavement networks. Engineering monitoring, determination of distress mechanisms and engineering solutions. Assignment of priorities to the engineering actions.

QA: CE 890

837. Transportation Materials Engineering
Fall of even-numbered years. 3(3-0)
Engineering characteristics of soils and materials commonly used in transportation facilities. Relationships of material engineering properties to pavement design and performance. Material behavior under cyclic loading.

QP: CE 418 QA: CE 815

838. Selected Topics in Highway and Airfield Engineering
Fall of odd-numbered years. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

Topics in pavement engineering such as fluid-deflection testing and back calculation of layer moduli, advanced application of finite element theory to pavement distress mechanisms and engineering solutions. Characteristics of various granular materials through the use of engineering properties and engineering mechanics analyses of joint and crack performance.

QP: CE 494

839. Stabilising Unbound Granular Materials
Fall of even-numbered years. 3(3-0)
Improving performance and engineering properties of various granular materials through the use of mechanical processes, and chemical or mineralogical additives. Characterization of engineering properties of stabilized materials.

QP: CE 418 QA: CE 819

841. Traffic Flow Theory
Spring, 3(3-0)
Microscopic and macroscopic traffic flow models, Queuing theory. Gap acceptance. Simulation models for network analysis. Intelligent vehicle highway systems.

QP: STT 351 QA: CE 843

842. Advanced Airport Systems Design
Fall of odd-numbered years. 3(3-0)
Analysis and design of airport systems using computer models. Design parameters, demand analysis. Runway orientation and capacity, airstrip delay, vehicle processing. Passenger processing.

QP: CE 442

843. Simulation and Optimisation of Urban Traffic Flow
Fall of even-numbered years. 3(3-0)
Statistical analysis of highway geometric designs and operational-control strategies with respect to the optimal flow of traffic, intersection, arterial, network design and control models. Traffic simulation. System optimization and management.

QP: CE 441, CE 449 QA: CE 841

844. Highway and Traffic Safety
Fall of odd-numbered years. 3(3-0)
Analysis of highway geometric design alternatives and operational-control strategies with respect to accident probability. Statistical methods of pattern identification, counterfeit selection and evaluation methodology. Risk management.

QP: CE 845, STT 423 QA: CE 844

845. Public Transportation System Planning
Fall of odd-numbered years. 3(3-0)
Planning and operating urban and rural transportation systems. Development of system and demand-responsive systems. Budgeting and programming of transportation services. Environmental impact statements. Para-transport and demand-responsive systems.

QP: CE 346 QA: CE 845, CE 941

846. Statewide Transportation Network Evaluation
Spring of even-numbered years. 3(3-0)
Transportation system measures, needs studies, sufficient ratings, Cost allocation models, programming and budget constraints. Corridor analysis, transportation economics, demand elasticity.

QP: CE 494 QA: CE 846

849. Transportation Research Methods
Spring, 3(3-0)
Application and interpretation of quantitative methods and experimental designs for transportation research; ANOVA, non-parametric, discriminant analysis, factor analysis, multivariate regression, SPSS.

QP: CE 351 QA: CE 849

890. Independent Study in Civil Engineering
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course.

II: Approval of department. Research problems of limited scope not pertaining to thesis accomplished under CE 889 or CE 999.

QA: CE 880

891. Selected Topics in Civil Engineering
Fall, Spring, Summer. 2 to 4 credits. A student may earn a maximum of 9 credits in all enrollments for this course.

Selected topics in new or developing areas of civil engineering.

QA: CE 890

899. Master’s Thesis Research
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 24 credits in all enrollments for this course.

QA: CE 899

902. Random Vibration of Structural and Mechanical Systems
Spring of even-numbered years. 3(3-0)
Interdepartmental with Mechanical Engineering and Materials Science and Mechanics.

P: CE 802 or ME 860, CE 810 or STT 351.

Probabilistic modeling of random excitations (e.g., earthquake, aeroelastic, and ocean wave loadings). Response of single and multiple degree-of-freedom systems to random excitation. Designing against failure for nonstationary and nonlinear problems.

QP: CE 802, ME 825, STT 381, STT 441 QA: CE 867

904. Advanced Structural Mechanics II
Spring, 3(3-0)

P: CE 894


QP: CE 804 QA: CE 890

906. Advanced Theory of Concrete Composites and Structures
Spring of odd-numbered years. 3(3-0)

P: CE 848

Applications of fracture mechanics and plastic theories to modeling the mechanical behavior of concrete composites and structures. Fiber reinforced concrete.

QP: CE 406 QA: CE 805, CE 803

915. Earth Structures
Fall of odd-numbered years. 3(3-0)

P: CE 812.


QP: CE 817 QA: CE 815

916. Soil Dynamics
Spring, 3(3-0)

P: CE 812.


QP: CE 317 QA: CE 916

921. Advanced Topics in Groundwater
Spring of even-numbered years. 3(3-0)

P: CE 812.

Formulation and use of numerical simulation to model the physics of flow and contaminant transport in complex settings or the mechanics of immiscible fluids in porous media.

QP: CE 821 QA: CE 921

929. Selected Topics in Hydraulics
Fall of odd-numbered years. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

P: CE 828 or CE 829 or CE 820.

Advanced fluid mechanics and hydraulics related to civil and environmental engineering.

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 72 credits in all enrollments for this course.

QA: CE 999

CLASSICAL STUDIES

CLA

Department of Romance and Classical Languages

College of Arts and Letters

120. English from Latin and Greek Roots
Fall of odd-numbered years. 3(3-0)
Prefixes, suffixes, and roots of English vocabulary from Greek and Latin word elements.

QA: CLA 220

121. Medical Terminology
Spring of odd-numbered years. 3(3-0)
Basic Greek and Latin word elements used in the formation of prefixes, suffixes, and roots.

QA: CLA 281

300. Greek Civilization
Fall. 3(3-0)

R: Not open to freshmen.

Political, social, religious, and intellectual life of ancient Greece from the Mycenaean period to the death of Alexander the Great, through such authors as Homer, Herodotus, Aeschylus, Euripides, Aristophanes, Thucydides, and Plato.

QA: CLA 326

310. Roman Civilization
Spring. 3(3-0)

R: Not open to freshmen.

Enduring features of Roman civilization to Justinian. Political institutions, religion, architecture, literary forms, creative arts, and gender roles.

QA: CLA 327

350. Greek and Roman Literature in English Translation
Spring of odd-numbered years. 3(3-0)

R: Not open to freshmen.

Representative works of major Greek and Roman authors.

QA: CLA 304, CLA 305

A-50