CIV

Civil Engineering

CIV 510: Advanced Foundation Engineering
The course is designed to provide students with the theory and experience-based knowledge necessary to evaluate and estimate soil properties and earth pressure for analysis and design of retaining walls, anchored bulkheads, and excavation bracing systems. Bearing capacity and settlement of shallow foundations are also covered. Semesters Offered: Fall
3 credits, Letter graded (A, A-, B+, etc.)

CIV 515: Analysis of Deep Foundations
This course covers topics related to the analysis and design of deep foundations including the design of vertically loaded drilled shafts and driven piles, the analysis of laterally loaded piles, and in-situ pile load tests.
3 credits, Letter graded (A, A-, B+, etc.)

CIV 522: Introduction to Coastal Engineering
Basic hydrodynamics of water waves. Topics include linear wave theory, energy, power and energy propagation, wave refraction, shoaling and breaking in the nearshore, diffraction by breakwaters and gaps, reflection and basin oscillations, wave statistics and spectra, wind-wave hindcast/forecast, wave forces on piles and pipes. Some coastal processes due to nonlinearity, including wave set-up/set-down, nearshore circulations and storm surges. Physical interpretations of mathematical formulas are particularly emphasized. Semesters Offered: Spring
3 credits, Letter graded (A, A-, B+, etc.)
May be repeated 1 times FOR credit.

CIV 523: Coastal Engineering Planning and Design
The basic principles involved in the planning and design of various types and functions of coastal structures and shore protective measures will be discussed. Topics will include review of linear wave theory, considerations of site conditions; design processes; design of sloping- and vertical-front costal structures; scour and scour protection; coastal sediment transport; shore protection measures such as coastal armoring, beach restoration, and beach stabilization; and introduction to harbor and marina.
3 credits, Letter graded (A, A-, B+, etc.)

CIV 524: Coastal Processes and Sediment Transport
This course describes processes associated with water and sediment movements close to shoreline. The topics covered in this course includes: sediment characteristics; long-term processes, hydraulics of coastal zone; field measurements techniques and analysis, equilibrium beach profiles, sediment transport, modeling of beaches and shorelines, shoreline modification and analysis including soft and hard engineering approaches and tidal inlets.
3 credits, Letter graded (A, A-, B+, etc.)

CIV 532: Structural Dynamics
Analysis of the dynamic response of structures and structural components to transient loads and foundation excitation; single-degree-of-freedom and multi-degree-of-freedom systems; response spectrum concepts; numerical methods for integration of the equations of motion; simple inelastic structural systems; systems with distributed mass and flexibility.
3 credits, Letter graded (A, A-, B+, etc.)

CIV 533: Intermediate Steel Design
Metal members under combined loads; connections, welded and bolted; moment-resistant connections; plate girders, conventional behavior, and tension field action.
3 credits, Letter graded (A, A-, B+, etc.)

CIV 534: Intermediate Reinforced Concrete Design
Strength, behavior, and design of indeterminate reinforced concrete structures, with primary emphasis on slab systems; emphasis on the strength of slabs and on the available methods of design of slabs spanning in two directions, with or without supporting beams.
3 credits, Letter graded (A, A-, B+, etc.)

CIV 535: Earthquake Engineering
Source mechanisms, stress waves, and site response of earthquake shaking; effect on the built environment; nature of earthquake actions on structures; fundamental structural response characteristics of stiffness, strength, and ductility; representation of the earthquake input in static and dynamic structural analysis; modeling of steel and concrete structures under earthquake effects; outputs for safety assessment; comprehensive source-to-design actions project.
3 credits, Letter graded (A, A-, B+, etc.)

CIV 544: Environmental Fluid Dynamics
Free surface flows of water and air occurring in natural fluid systems and influencing environmental transport and mixing. Fundamental principles of fluids, covering the scales relevant to both engineering and geophysical applications. Topics include waves, instability, stratification, turbulent boundary layers, jets and plumes, and river hydraulics.
3 credits, Letter graded (A, A-, B+, etc.)

CIV 595: Independent Study in Civil Engineering
Students can register this course in order to conduct research or participate in a project under the supervision of one or more members of the Civil Engineering faculty.
1-6 credits, Letter graded (A, A-, B+, etc.)
May be repeated 2 times FOR credit.

CIV 599: M.S. Thesis Research
This course is taken by M.S. students for their thesis research work.
1-12 credits, S/U grading
May be repeated 2 times FOR credit.

CIV 680: Special Topics in Transportation Engineering
The subject matter of special topics course can vary semester to semester depending on the interests of the students and the faculty, and the contemporary topics in transportation field.
3 credits, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

CIV 681: Special Topics In Geomechanics and Geotechnical Engineering
The subject matter of special topics course can vary semester to semester depending on the interests of the students and the faculty, and the contemporary topics in geotechnical engineering field.
3 credits, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

CIV 682: Special Topics in Ocean and Coastal Engineering
The course is designed for the discussion of topics of special interest on demand that may not be covered in regularly scheduled courses. Varying topics from ocean wave mechanics, offshore structures, coastal processes, sediments and morphology to estuarine dynamics may be offered concurrently.
3 credits, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

CIV 683: Special Topics in Structural Engineering
The subject matter of special topics course can vary semester to semester depending on
the interests of the students and the faculty, and the contemporary topics in structural engineering field.

3 credits, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

**CIV 684: Special Topics in Water Resources and Environmental Engineering**
The course is designed for the discussion of topics of special interest on demand that may not be covered in regularly scheduled courses. Varying topics from water treatment, solid waste management, urban and watershed hydrology, stormwater management, water quality modeling to environmental fluid mechanics may be offered concurrently.

3 credits, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

**CIV 685: Special Topics in Materials Engineering**
The subject matter of special topics course can vary semester to semester depending on the interests of the students and the faculty, and the contemporary topics in materials engineering field.

3 credits, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

**CIV 691: Civil Engineering Seminar**
This course is designed to expose students to cutting-edge research and development activities in civil engineering. Speakers are invited from both on and off campus. Fall and spring. 0 credits, S/U grading. May be repeated.

S/U grading
May be repeated for credit.

**CIV 697: Practicum in Teaching I**
Every TA must register for this course

Fall, 1 credit, S/U grading
May be repeated for credit.

**CIV 698: Practicum in Teaching II**
Practicum in teaching under faculty supervision 1-3 credits, S/U grading May be repeated for credit

1-3 credits, S/U grading
May be repeated for credit.

**CIV 699: Dissertation Research On Campus**
Students have to register for this class during their dissertation research after advancement to candidacy. Major portion of research must take place on SBU campus, at Cold Spring Harbor, or at the Brookhaven National Lab.

1-9 credits, S/U grading
May be repeated for credit.

**CIV 700: Dissertation Research Off Campus-Domestic**
Students have to register for this class during their dissertation research after advancement to candidacy. Major portion of research will take place off-campus, but in the United States and/or U.S. provinces. All international students must enroll in one the graduate student insurance plans and should be advised by an international advisor.

1-9 credits, S/U grading
May be repeated for credit.

**CIV 701: Dissertation Research Off Campus-International**
Major Portion of research will take place outside of the United States and/or U.S. provinces. Domestic students have the option of the health plan and may also enroll in MEDEX. International students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed. International students who are not in their home country are charged for the mandatory health insurance. If they are to be covered by another insurance plan they must file a waiver be second week of classes. The charge will only be removed if other plan is deemed comparable. All international students must receive clearance for an International Advisor

1-9 credits, S/U grading
May be repeated for credit.