Civil Engineering Courses

Courses

CE 1205. Graphics Fdmtls in Engr Desgn.
Graphics Fundamentals in Engineering Design Fundamentals of multi-view projections, auxiliaries, sections, pictorial drawings, dimensioning; introduction to CAD, decision process, and geographical information systems.
2 Credit Hours
4 Total Contact Hours
3 Lab Hours
1 Lecture Hours
0 Other Hours

CE 1301. Civil Engineering Fundamentals.
Principles used in the analysis, design, construction and maintenance of civil engineering infrastructure systems. Concepts of sustainability and environmental impact, civil engineering as a profession and expectations of ethical behavior.
3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours

Major Restrictions:
Restricted to majors of CE, CEM

Corequisite(s):
MATH1411

Principles and methods of surveying, hands on experience in the use of modern surveying instruments, fundamentals of global positioning system (GPS) and Geographic Information Systems (GIS), use GPS/GIS software for surveying applications.
3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours

Prerequisite(s):
(MATH 1508 w/C or better)

CE 2315. Statics.
Newtonian mechanics of force systems, equilibrium of particles and rigid body, forces in space, distributed forces, centroids and friction.
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Prerequisite(s):
(MATH 1411 w/C or better) OR (MATH 1312 w/C or better) OR (MATH 2313 w/C or better) OR (MATH 2326 w/C or better) OR (MATH 1411A w/C or better AND MATH 1411B w/C or better AND MATH 1411C w/C or better) AND (CE 1301 w/C or better AND PHYS 2320 w/C or better) OR (PHYS 2420 w/C or better)

CE 2326. Econ for Engrs & Scientists.
Application of economics to engineering and industrial problems which require knowledge of engineering for their solution.
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Stress and strain theories, axial loading, torsion, study of combined stresses, beam and column design, and basic structural analysis.

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Prerequisite(s): (CE 2315 w/C or better)

The objective of the course is to introduce students to the principles of physical geology and their applications in the civil engineering profession. At the end of the course, students will have a foundation in geology such that they will be able to communicate with geologists and geophysicists or read geological reports that are pertinent to engineering projects. Emphasis in laboratories will be placed on practical engineering problems that require the use of geology and geophysics.

3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours

Major Restrictions:
Restricted to majors of CE,CEM,LDCE

CE 2338. Mechanics II (Dynamics).
Dynamics of particles and rigid bodies, work and energy, impulse and momentum.

3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours

Prerequisite(s): (CE 2315 w/C or better ) AND (MATH 1312 w/C or better)

CE 2341. Engineering Analysis I.
Concepts and modeling of ordinary and partial differential equations for a variety of engineering phenomena using finite difference, finite volume, and finite element techniques. Introduction to statistics, data analysis, and probability theories.

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Major Restrictions:
Restricted to majors of CE,IT,LDCE,LDIE,LDME,LDMT,ME,MT

Classification Restrictions:
Restricted to class of JR,SO,SR

Prerequisite(s): (MATH 2326 w/C or better)

CE 2343. Structural Analysis.
A study of framed structures, trusses, girders, and beams including applications of static and moving loads on bridges.

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Major Restrictions:
Restricted to majors of CE,CEM,LDCE

Prerequisite(s): (CE 2334 w/C or better)
Fundamental concepts of discrete and continuous random variables, distribution functions, moments, moment generating functions, statistical dependence, stochastic modeling and random events, graphical and numerical methods, descriptive and inferential statistics, point and interval estimation, hypothesis testing and regression analysis. The creation and proper utilization of statistical decision models for engineering analysis and design are stressed. Emphasis is on measurement, formulation analysis and design of physical problems.
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Major Restrictions:
Restricted to majors of CE,IE,LDCE,LDIE

Prerequisite(s): (MATH 2313 w/C or better)

CE 2375. Intro to Fluid Mechanics.
Introduction to Fluid Mechanics An introduction to the basic concepts of thermodynamics and fluid mechanics to include properties, property relationships, states, and fields. Presentation of the basic equations of thermal-fluid science, continuity, first and second laws of thermodynamics and momentum.
3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours

Prerequisite(s): (CE 2315 w/C or better)

CE 2377. Electro Mechanical Systems.
3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours

Prerequisite(s): (MATH 1312 w/C or better)

CE 2385. Environmental Engr Fundamental.
Introduction to the engineering aspects of environmental systems to include such topics as water quality management, air pollution and control, solid and hazardous waste management, environmental impact assessment, and governmental regulation.
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Major Restrictions:
Restricted to majors of CE,LDCE

Prerequisite(s): (CE 2375 w/C or better AND CHEM 1305 w/C or better)

CE 3153. Water & Waste Water Laboratory.
Laboratory analysis of water and wastes.
1 Credit Hour
1 Total Contact Hour
1 Lab Hour
0 Lecture Hour
0 Other Hour

Major Restrictions:
Restricted to majors of CE

Prerequisite(s): (CE 3342 w/D or better)
Engineering Measurements (2-3) Theory and practice of surveying measurements with emphasis on precision, errors, significant figures, the use of the level, transit, and engineer's tape.
3 Credit Hours
5 Total Contact Hours
2 Lecture Hours
0 Other Hours
Prerequisite(s): (CE 1205 w/C or better ) OR (IE 1205 w/C or better)

CE 3325. Environmental Engr Fundamental.
Environmental Engineering Fundamentals (3-0) Introduction to the engineering aspects of environmental systems to include such topics as mass and energy balances, sustainable systems, water pollution, air pollution and control, solid and hazardous waste management, risk assessment, global problems, and governmental regulation.
3 Credit Hours
3 Total Contact Hours
3 Lecture Hours
0 Other Hours
Prerequisite(s): (CE 2375 w/C or better ) OR (MECH 2311 w/C or better)

CE 3334. Construction Management.
An understanding of construction management issues such as: procurement of work, bidding versus quality-based selection processes, how the design professionals and the construction professionals interact to construct a project.
3 Credit Hours
3 Total Contact Hours
3 Lecture Hours
0 Other Hours
Major Restrictions:
Restricted to majors of CE,CEM
Classification Restrictions:
Restricted to class of JR,SR

Geological Engineering (2-3) The objective of the course is to introduce students to the principles of physical geology and their applications in the civil engineering profession. At the end of the course, students will have a foundation in geology such that they will be able to communicate with geologists and geophysicists or read geological reports that are pertinent to engineering projects. Emphasis in laboratories will be placed on practical engineering problems that require the use of geology and geophysics.
3 Credit Hours
5 Total Contact Hours
2 Lecture Hours
0 Other Hours
Major Restrictions:
Restricted to majors of CE
Classification Restrictions:
Restricted to class of JR,SR
Prerequisite(s): (BE 1205 w/C or better ) OR (CE 1205 w/C or better ) OR (IE 1205 w/C or better)
Civil Engineering Materials (2-3) Properties of civil engineering materials, measurements and test methods, relationship of properties to performance; their structure and behavior: relationship between structure and behavior.

3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours

Prerequisite(s): (CE 2334 w/C or better)

Study of basic processes involved in conventional water and wastewater treatment plants. Coverage include theory and preliminary design consideration.

3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours

Prerequisite(s): (CE 2375 w/C or better)

CE 3343. Structural Analysis I.
Structural Analysis (2-3) A study of framed structures, trusses, girders, beams including applications of static and moving loads and bridges.

3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours

Classification Restrictions:
Restricted to class of JR,SR

Prerequisite(s): (CE 2334 w/D or better ) OR (MECH 2322 w/D or better)

CE 3345. Design of Concrete Structures.
Reinforced concrete theory; design of beams, columns, slabs, footings, and retaining walls using current design specifications.

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Prerequisite(s): (CE 3343 w/D or better)

CE 3348. Geotechnical Engineering.
Physical and mechanical properties of soils, plasticity, shrinkage, permeability seepage, consolidation, shear strength, Rankine and Coulomb earth pressure and braced cuts.

3 Credit Hours
5 Total Contact Hours
3 Lab Hours
2 Lecture Hours
0 Other Hours

Major Restrictions:
Restricted to majors of CE,CEM

Prerequisite(s): (CE 3336 w/D or better)

Corequisite(s): CE2335
**CE 3361. Design of Steel Structures.**
Concepts of the design of steel structures using the load and resistance factor design (LRFD) philosophy; design members in tension, members in compression, beams, beam-columns, and connections; and design of trusses and frames.

3 Credit Hours  
3 Total Contact Hours  
0 Lab Hours  
3 Lecture Hours  
0 Other Hours

**Major Restrictions:**  
Restricted to majors of CE

**Prerequisite(s):**  
(CE 2343 w/C or better)

**CE 3373. Engr Probability & Statscl Model.**
Fundamental concepts of discrete and continuous random variables, distribution functions, moments, moment generating functions, statistical dependence, stochastic modeling and random events, graphical and numerical methods, descriptive and inferential statistics, point and interval estimation, hypothesis testing and regression analysis. The creation and proper utilization of statistical decision models for engineering analysis and design are stressed. Emphasis is on measurement, formulation analysis and design of physical problems.

3 Credit Hours  
3 Total Contact Hours  
0 Lab Hours  
3 Lecture Hours  
0 Other Hours

**Major Restrictions:**  
Restricted to majors of CE,IE,LDCE,LDIE,LDME,LDMT,ME,MT

**Prerequisite(s):**  
(MATH 1411 w/C or better) OR (MATH 1312 w/C or better) OR (MATH 2313 w/C or better) OR (MATH 2326 w/C or better) OR (MATH 1411A w/C or better AND MATH 1411B w/C or better AND MATH 1411C w/C or better)

**CE 3456. Hydrology & Hydraulic Engr.**
Essential principles of hydraulics and hydrology demonstrated in the laboratory and applied to the design of hydraulic structures.

4 Credit Hours  
6 Total Contact Hours  
3 Lab Hours  
3 Lecture Hours  
0 Other Hours

**Prerequisite(s):**  
(CE 2375 w/C or better) OR (MECH 2311 w/C or better)

**CE 3490. Intro to Air Pollution.**
Introduction to Air Pollution (3-3) Classification of air pollutants and their effects on man, animals, plants, and the environment; meteorological aspects of air pollution; sources of air pollution; plume characteristics; units of measurement; physical properties of dusts, gases, and aerosols.

4 Credit Hours  
6 Total Contact Hours  
3 Lab Hours  
3 Lecture Hours  
0 Other Hours

**Prerequisite(s):**  
(CE 2375 w/C or better) OR (MECH 2311 w/C or better)

**CE 4153. Water and Waste Laboratory.**
Water and Waste Laboratory (0-3) Laboratory analysis of water and wastes.

1 Credit Hour  
3 Total Contact Hour  
3 Lab Hour  
0 Lecture Hour  
0 Other Hour

**Prerequisite(s):**  
(CE 4341 w/D or better) OR (CE 4342 w/D or better)
CE 4158. Constr Methods & Matrls Lab.
Problem solving involving the use of materials and methods on construction projects.
1 Credit Hour
3 Total Contact Hour
3 Lab Hour
0 Lecture Hour
0 Other Hour

Major Restrictions:
Restricted to majors of CEM

CE 4171. Engineering Problems.
Engineering Problems (0-0-1) Original investigation of special problems in the student's field, the problem to be selected by the student with the approval of the head of the department. May be repeated for credit.
1 Credit Hour
1 Total Contact Hour
0 Lab Hour
0 Lecture Hour
1 Other Hour

Major Restrictions:
Restricted to majors of CE

Classification Restrictions:
Restricted to class of SR

CE 4181. Co-op Work Experiences.
Co-op Work Experiences (0-0-1) Work experience in business, industrial, governmental professional, service, or other organizations to provide on-the-job training and professional preparation in the student's area of interest. A report covering the work experience must be submitted by the student to the departmental Co-op coordinator at the end of each work period. Upon completion of his or her third work period and submission of a report summarizing the total work experience, a student can use three hours of Co-op work experience in his or her degree plan in place of a technical elective or elective in the major.
1 Credit Hour
1 Total Contact Hour
0 Lab Hour
0 Lecture Hour
1 Other Hour

Classification Restrictions:
Restricted to class of JR,SR

CE 4182. Co-op Work Experiences.
Co-op Work Experiences (0-0-1) Work experience in business, industrial, governmental, professional, service, or other organizations to provide on-the-job training and professional preparation in the student's area of interest. A report covering the work experience must be submitted by the student to the departmental Co-op coordinator at the end of each work period. Upon completion of his or her third work period and submission of a report summarizing the total work experience, a student can use three hours of Co-op work experience in his or her degree plan in place of a technical elective or elective in the major.
1 Credit Hour
1 Total Contact Hour
0 Lab Hour
0 Lecture Hour
1 Other Hour

Classification Restrictions:
Restricted to class of JR,SR
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CE 4183. Co-op Work Experiences.
Co-op Work Experience (0-0-1) Work experience in business, industrial, governmental, professional, service, or other organizations to provide on-the-job training and professional preparation in the student's area of interest. A report covering the work experience must be submitted by the student to the departmental Co-op Coordinator at the end of each work period. Upon completion of his or her third work period and submission of a report summarizing the total work experience, a student can use three hours of Co-op Work experience in his or her degree plan in place of a technical elective or elective in the major.

1 Credit Hour
1 Total Contact Hour
0 Lab Hour
0 Lecture Hour
1 Other Hour

Classification Restrictions:
Restricted to class of JR,SR

CE 4188. Senior Design I.
Senior Design I (0-3) Conceptual and preliminary design project.

1 Credit Hour
3 Total Contact Hour
3 Lab Hour
0 Lecture Hour
0 Other Hour

Junior Professional Orientation (1-0) Introduction to the Engineering profession with emphasis on job placement, professional ethics and engineering field examination. Required of all students prior to graduation.

1 Credit Hour
6 Total Contact Hour
3 Lab Hour
3 Lecture Hour
0 Other Hour

CE 4271. Engineering Problems.
Engineering Problems (0-0-2) Original investigation of special problems in the student's field, the problem to be selected by the student with the approval of the head of the department. May be repeated for credit.

2 Credit Hours
2 Total Contact Hours
0 Lab Hours
0 Lecture Hours
2 Other Hours

Major Restrictions:
Restricted to majors of CE

Classification Restrictions:
Restricted to class of SR

CE 4288. Senior Design II.
Senior Design II (1-3) Final design project.

2 Credit Hours
4 Total Contact Hours
3 Lab Hours
1 Lecture Hours
0 Other Hours

Major Restrictions:
Restricted to majors of CE

Classification Restrictions:
Restricted to class of SR
CE 4334. Construction Management I.
An understanding of construction management issues such as: procurement of work, bidding versus quality-based selection processes, how the design professionals and the construction professionals interact to construct a project.

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Major Restrictions:
Restricted to majors of CE,IE,LDCE,LDIE,LDME,LDMT,ME,MT

Classification Restrictions:
Restricted to class of SR

Prerequisite(s): (CE 2326 w/C or better)

CE 4339. Geostructural Design.
This course is concerned with Geostructural Design as it applies to foundations for buildings and other structures, such as retaining walls. It also includes the design of natural slopes, the dewatering of soils, and mechanical and chemical stabilization of soils, and pavement design.

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Major Restrictions:
Restricted to majors of CE,CEM

Prerequisite(s): (CE 3348 w/D or better)

CE 4340. Transportation Engineering.
Transportation Engineering (3-0) Study of planning economics, finance, location, design and administration of transportation systems.

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Prerequisite(s): (CE 3313 w/D or better ) AND (CE 3373 w/D or better ) OR (IE 3373 w/D or better)

CE 4342. Water & Wastewater Engineering.
Water and Wastewater Engineering (3-0) Study of basic processes involved in conventional water and wastewater treatment plants. Coverage includes theory and preliminary design considerations.

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Classification Restrictions:
Restricted to class of JR,SR

Prerequisite(s): (CE 2375 w/D or better ) OR (MECH 2311 w/D or better)
CE 4348. Geotechnical Engineering.
Geotechnical Engineering (2-3) Physical and mechanical properties of soils, plasticity, shrinkage, permeability seepage, consolidation, shear strength, Rankine and Coulomb earth pressure and braced cuts.
3 Credit Hours  
5 Total Contact Hours  
2 Lecture Hours  
0 Other Hours  

Major Restrictions:
Restricted to majors of CE

Prerequisite(s): (CE 2334 w/C or better ) OR (MECH 2322 w/C or better ) AND (CE 3336 w/C or better ) AND (GEOL 3321 w/C or better ) OR (CE 3335 w/C or better)

CE 4349. Foundation Engineering.
Foundation Engineering (3-0) Subsoil exploration, spread footings, mat foundations, retaining walls, sheet pile structures, braced cuts, pile foundation, and cassions.
3 Credit Hours  
3 Total Contact Hours  
3 Lecture Hours  
0 Other Hours  

Prerequisite(s): (CE 4448 w/D or better)

CE 4354. Electrical & Mech Construction.
Students in this course will be provided with an understanding of electrical and mechanical contracting work practices, including estimating and bidding, labor requirements, equipment requirements, material specifications, and potential problems occurring in this field of contracting.
3 Credit Hours  
3 Total Contact Hours  
3 Lecture Hours  
0 Other Hours  

CE 4358. Construction Methods & Materls.
An introduction to the use of materials and methods on construction projects, including wood, steel, and concrete construction and earthwork. The course requires a final project report and presentation involving planning construction methods for a project and a national exam on general construction knowledge.
3 Credit Hours  
3 Total Contact Hours  
3 Lecture Hours  
0 Other Hours  

Major Restrictions:
Restricted to majors of CEM

CE 4361. Structural Design II.
Structural Design II (3-0) Design of steel structures including the application of plastic design methods using current design specifications.
3 Credit Hours  
3 Total Contact Hours  
3 Lecture Hours  
0 Other Hours  

Major Restrictions:
Restricted to majors of CE

Classification Restrictions:
Restricted to class of JR,SR

Prerequisite(s): (CE 3343 w/D or better)
Engineering Problems-Seminar (0-0-3) Original investigation of special problems in the student's field, the problem to be selected by the student with the approval of the head of the department. Can be repeated for credit.
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours

Major Restrictions:
Restricted to majors of CE

Classification Restrictions:
Restricted to class of SR

CE 4375. Adv. Topics in Civil Engr..
Advanced Topics in Civil Engineering (3-0) Presentation of contemporary issues and advanced topics in all areas of Civil Engineering.
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Classification Restrictions:
Restricted to class of JR,SR

CE 4376. Adv Topics in Civ Engr II.
Presentation of contemporary issues and advances in all areas of civil engineering.
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Major Restrictions:
Restricted to majors of CE

Classification Restrictions:
Restricted to class of SR

CE 4377. Adv Topics in Civil Engr III.
Presentation of contemporary issues and advances in all areas of civil engineering.
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Major Restrictions:
Restricted to majors of CE

Classification Restrictions:
Restricted to class of SR

Students in this course will be provided with an understanding of proposal writing, construction cost estimating, bidding procedures, and bid scheduling.
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
CE 4385. Construction Internship.
This internship course requires students to work at a construction company or at a government agency that is involved in construction management and engineering and that is approved by UTEP.

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours

CE 4386. Construction Law & Ethics.
This course is designed to give students a working knowledge of construction contracts, contract participants' role and responsibilities, licensing and regulatory requirements, lien laws and contractor rights, national and local labor laws, and procedures to avoid disputes. It also teaches students how to work with each of the important terms of a contract.

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

CE 4387. Construction Scheduling.
Students will gain an understanding of project plans, task identification, bar chart schedules, critical path schedules, and resource management.

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

Prerequisite(s): (CE 4382 w/D or better)

CE 4388. Senior Design.
Senior Design (1-6) Conceptual, preliminary and final design projects.

3 Credit Hours
7 Total Contact Hours
6 Lab Hours
1 Lecture Hours
0 Other Hours

Major Restrictions:
Restricted to majors of CE

CE 4389. Construction Safety.
Students in this course will be provided with an understanding of safe work practices, mandatory training, record keeping and maintenance, compliance with OSHA worker safety and environmental safety laws, inspection procedures, and penalties for lack of conformance to safety laws. Students will also learn procedures for recognizing hazards, performing CPR, attending site safety meetings, and conducting accident investigations.

3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours