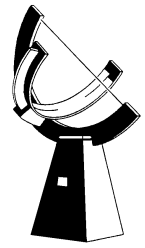


INFORMATION FOR TRANSFER STUDENTS

College of Engineering, Cornell University



Thanks for your interest!

Every year hundreds of students from two- and four-year colleges and universities apply to the College of Engineering for transfer, and many are accepted. To help you make a smooth transition, we have prepared this information about the College and the transfer process.

Prerequisites for transfer:

The most important criteria for admission to the College of Engineering are the content and rigor of the college-level courses you have taken and how well you performed in them. You are not likely to be accepted unless you have a grade-point average above 3.0 (equivalent to a B) in a rigorous, accredited engineering, engineering science, or pre-engineering program.

Your preparation should include courses in college-level calculus, chemistry, physics (calculus-based), computer programming and writing. For complete details about prerequisite courses for each of Cornell's Engineering majors, please see the section of this flyer entitled "*Engineering Curriculum Overview & Requirements*." Feel free to call or write the Engineering Admissions Office (see contact information below) if you have specific questions or concerns.

How to apply:

The Cornell View Book and transfer application are available from the Undergraduate Admissions Office, the Engineering Admissions Office, and online at:
www.admissions.cornell.edu.

Completed applications for transfer candidates must be received no later than March 15.

In addition to your application, high school and college records, we encourage you to submit scores for any SAT, SAT Subject Tests, and/or ACT tests that you may have taken previously. While not required, these scores may work in your favor as a transfer applicant. If your native language is not English, we also require that you submit TOEFL scores.

Your application must include a transcript showing at least one year of college work and course descriptions for each course you have completed, any course(s) for which you received advanced placement credit, and any course(s) you are in the process of taking.

All transfer students must send a mid-term report with estimated grades for courses in progress. This report should be completed and signed by your instructors. A mid-term report form is included in the transfer application.

Class standing and course transfer:

Transfer students are accepted for fall matriculation only, and at least four semesters in residence at Cornell are required for a degree. Transfer applicants are usually admitted either as sophomores or juniors.

Accepted students typically receive their transfer credit award during orientation in August, when they arrive on campus and meet with their faculty advisors. (Accepted students may also receive a tentative credit award during the spring or summer by request.)

Students may transfer up to 72 credits toward their Cornell degree. Credit may also be available for Advanced Placement exam results and Cornell Advanced Standing Exams (offered during fall orientation).

Please note that Cornell only transfers *credits* from a previous institution. Prior grades and grade point averages are not calculated into a transfer student's Cornell record.

Need More Information?

Feel free to contact the Engineering Admissions Office as indicated below. We would be pleased to answer any questions you may have.

Engineering Admissions, Cornell University

102 Hollister Hall, The Swanson Center

Ithaca, NY, 14853-3501

Phone: 607-255-5008 | Fax: 607-255-0971

Email: enr_admissions@cornell.edu

Engineering Web site: www.engineering.cornell.edu

Info: www.engineering.cornell.edu/admissions/applying/transfer/

Cornell University Web site: www.cornell.edu

Undergraduate Admissions Office

Phone: (607) 255-5241

Web site: admissions.cornell.edu

Cornell Financial Aid Office

Phone: (607) 255-5145

Email: cornellu_fin_aid@cornell.edu

Web site: finaid.cornell.edu

Cornell Course Descriptions (listed alphabetically)

For complete course descriptions, see the Cornell Courses of Study at: <http://www.cuinfo.cornell.edu/Academic/Courses/>

A&EP 363 Electronic Circuits

4 credits. Analyze, design, build and test circuits used in scientific and engineering instrumentation (with discrete components and integrated circuits). Analog circuits: resistors, capacitors, operational amplifiers, filters, diodes and transistors. Digital circuits: combinatorial (gates) and sequential (flip-flops, counters, shift registers) logic. Computer interfacing introduced and used to investigate digital-to-analog(DAC) and analog-to-digital conversion (ADC) and signal averaging.

BEE 151 Introduction to Computer Programming

4 credits. Intro to programming, program analysis, algorithm development and data structures in an engineering context using MATLAB. Applied to problems of interest in biological and environmental engineering.

BIO G 101/103 Biological Sciences (Lecture & Lab)

2 credits each course. The chemical and cellular basis of life, energy transformations, physiology, neurobiology and behavior.

BIO G 102/104 Biological Sciences (Lecture & Lab)

2 credits each course. Genetics, development, evolution and ecology.

BIO G 109 Biological Principles

3 credits. Biological diversity, genetics, evolution, ecology, behavior and conservation biology. Course includes laboratory component.

BIO G 110 Biological Principles

3 credits. Human physiology, plant development, genetic engineering, infectious diseases, and human health.

CHEM 207 General Chemistry

4 credits. The fundamental chemical principles and descriptive facts are covered, with considerable attention given to the quantitative aspects and to the techniques important for further work in chemistry. CHEM 207 deals primarily with the structure and bonding of atoms and molecules; (Course includes a laboratory component.)

CHEM 208 General Chemistry

4 credits. The fundamental chemical principles and descriptive facts are covered, with considerable attention given to the quantitative aspects and to the techniques important for further work in chemistry. CHEM 208 is concerned primarily with chemical reactions and reactivity. (Course includes a laboratory component.)

CHEM 211 Chemistry for the Applied Sciences

4 credits. The important chemical principles and facts are covered with the objective of understanding the role of chemistry in engineering and other fields. Emphasis is on topics such as solid-state materials, periodic trends, and specific classes of compounds, such as polymers. (Course includes a laboratory component.)

CHEM 257 Intro to Organic & Biological Chemistry

3 credits. An introduction to organic chemistry with an emphasis on those structures and reactions of organic compounds having particular relevance to biological chemistry.

CHEM 290 Physical Chemistry II Lab

2 credits. A general review of topics central to the area of physical chemistry, including solution kinetics, bomb calorimetry, production of binary liquid phase diagrams with gas chromatographic analysis of the phases, radiochemistry, statistical analysis of errors in data sets, and FTIR analyses of small gas phase molecules.

CHEM 389-390 Honors Physical Chemistry I & II

4 credits each. The principles of physical chemistry are studied from the standpoint of the laws of thermodynamics, kinetic theory, statistical mechanics, and quantum chemistry.

CHEM 323 Fluid Mechanics

3 credits. Fundamentals of fluid mechanics. Macroscopic and microscopic balances. Applications to problems involving viscous flow.

COM S 100 Introduction to Computer Programming

4 credits. Introduction to computer programming concepts. Topics include algorithms, language concepts, object-oriented concepts, procedures and functions, arrays, and strings. Principles of software development, style and testing are emphasized. There are two versions of the course. Java and MATLAB are the primary languages.

COM S 280 Discrete Structures

3 credits. Covers the mathematics that underlies most of computer science. Topics include induction: logical proof; propositional and predicate calculus; combinatorics and discrete mathematics. These topics are discussed in the context of applications to many areas of computer science, including game playing, the RSA cryptosystem, data mining, load balancing in distributed systems, properties of the Internet and World Wide Web, and web searching.

COM S 312 Data Structures & Functional Programming

4 credits. An advanced programming course that emphasizes functional programming techniques and data structures. Programming topics include recursive and higher-order procedures, models of programming language evaluation and compilation, type systems, and polymorphism. Data structures and algorithms covered include graph algorithms, balanced trees, memory heaps, and garbage collection. Also covers techniques for analyzing program performance and correctness.

EAS 131 Basic Principles of Meteorology

3 credits. Structure of the atmosphere: heat balance of the Earth; general and secondary circulations; air masses, fronts, and cyclones; and hurricanes, thunderstorms, tornadoes, and atmospheric condensation. In the laboratory, emphasis is on techniques of analysis of weather systems.

EAS 220 The Earth System

3 credits. Integrated introduction to the earth system stressing the biological, chemical, geological, and physical interactions among the atmosphere, ocean, and solid earth. Topics include biogeochemical cycles, climate dynamics, and the evolution of the atmosphere, biosphere, cryosphere (ice), hydrosphere (oceans and inland waters), and lithosphere (solid earth).

EAS 250 Meteorological Observations & Instruments

3 credits. Methods and principles of meteorological measurements and observations including surface, free-air, and remote systems. Instrument siting, mounting, and protection. Instrument response characteristics, calibration, and standardization. Recorders and data logging systems. Laboratory exercises in observation, data analysis.

ECE 220 Signals & Information

3 or 4 credits (ECE majors must enroll for 4 credits). Introductory course in signal processing. Topics include frequency based representations: Fourier series and discrete Fourier transform; discrete time linear systems: input/output relationships, filtering, spectral response, analog-to-digital/digital-to-analog conversion; continuous time signals and linear time invariant systems: frequency response and continuous-time Fourier transform.

ECON 301 Microeconomics III

4 credits. An introduction to the theory of consumer and producer behavior and to the functioning of the price system.

ENGRD 201 Intro to Physics & Chemistry of the Earth

3 credits. Formation of the solar system: accretion and evolution of the earth. The rock cycle: geological time scale, plate tectonics, rock and minerals, earth dynamics, mantle plumes. The hydrologic cycle: runoff, sedimentation, groundwater flow, contaminant transport. Weathering cycle: chemical cycles, rock cycle, controls on global temperature (CO₂ or ocean currents), oil and mineral resources.

ENGRD 202 Mechanics of Solids

4 credits. Principles of static: forces systems and moments; equilibrium of particles, bodies, trusses, frameworks and mechanism. Mechanics of solids: tension stress and strain; shear stress and strain; mechanical properties; axial force and statically indeterminate axial problems; torsion of round bars; shearing force, bending moment and bending stresses for symmetric beams, deflection of cantilever and simply-supported beams.

ENGRD 203 Dynamics

3 credits. Newton and Euler dynamics of a particle and rigid body. Kinematics: velocity, acceleration, polar coordinates, angular velocity and acceleration, and motion relative to a moving frame. Principles of linear and angular momentum balance and work-energy. Examples include particle ballistics, pendula, wheels, pulleys, gears, mass-spring-dashpot, simple vehicle dynamics, simple mechanisms, and dynamic balance.

ENGRD/ECE 210 Intro to Circuits for Elec. & Comp. Engrs

3 or 4 credits (ECE majors must enroll for 4 credits). A first course in electrical circuits and electronics that establishes fundamental properties of circuits with application to modern electronics. Topics include: circuit analysis methods, operational amplifiers, basic filter circuits, elementary transistor principles. (Includes laboratory component and final design project.)

ENGRD 211 Computers & Programming

3 credits. Intermediate programming in a high-level language and introduction to computer science. Topics include program structure and organization, object-oriented programming (classes, objects, types, sub-typing), graphical user interfaces, algorithm analysis (asymptotic complexity, big "O" notation), recursion, data structures (lists, trees, stacks, queues, heaps, search trees, hash tables, graphs), and simple graph algorithms. Java is the principal programming language.

ENGRD 219 Mass & Energy Balances

3 credits. Engineering problems involving material and energy balances. Batch and continuous reactive systems in the steady and unsteady states. Introduction to phase equilibria for multicomponent systems.

ENGRD 221 Engineering Thermodynamics

3 credits. The definitions, concepts, and laws of thermodynamics. Topics considered include applications to ideal and real gases, vapor and gas power systems, refrigeration and heat pump systems. Examples and problems are related to contemporary aspects of energy, power generation and broader environmental issues.

ENGRD 230 Introduction to Digital Logic Design

4 credits. An introduction to the design and implementation of practical digital circuits. Topics include transistor network design, Boolean algebra, combinational and sequential circuits, finite state machine design, and analog and digital converters. Weekly lab includes design methodology using discrete components and hardware description languages.

ENGRD 251 Engineering for a Sustainable Society

3 credits. Case studies of contemporary environmental issues, including pollutant distribution in natural systems, air quality, hazardous waste management, and sustainable development. Emphasis is on the application of math, physics, and engineering sciences to solve energy and mass balances in environmental sciences. Students are introduced to the basic chemistry, ecology, biology, ethics, and environmental legislation relevant to the particular environmental problem.

ENGRD 261 Mechanical Properties of Materials: from Nanodevices to Superstructures

3 credits. Mechanical properties of materials (strength, stiffness, toughness, ductility, etc.) and their physical origins are examined. The relationship of the elastic, plastic, and fracture behavior to microscopic structure in metals, ceramics, polymers, and composite materials is explored. Effects of time and temperature on materials properties are discussed. Considerations for design and optimal performance of materials and engineered objects.

ENGRD 262 Elec. Materials for the Information Age

3 credits. Electrical and optical properties of materials. Topics include mechanism of electrical conduction in metals, semiconductors and insulators, the tuning of electrical properties in semiconductors, the transport of charge across metal/semiconductor and semiconductor/metal junctions, and the interaction of materials with light. Applications in electrophotography, solar cells, electronics, and display technologies are discussed.

ENGRD 264 Computerized Instrumentation Design

3 credits. Covers the use of a small computer in an engineering or scientific research laboratory. Experiments and devices investigated include analog-to-digital (ADC) and digital-to-analog (DAC) converters, Digital input/output (I/O), counter/timers, serial port communications, digital temperature control, error analysis, nonlinear least squares fitting of experimental data, viscosity of fluids, a robot arm, and thermal diffusion. C++ and LabVIEW are used for computer interfacing to hardware. A second goal of the course is to develop effective written communication skills in the context of science and engineering.

ENGRD 270 Engineering Probability & Statistics

3 credits. This course gives students a working knowledge of basic probability and statistics and their application to engineering. Computer

analysis of data and simulation are included. Topics include random variables, probability distributions, expectation, estimation, testing, experimental design, quality control, and regression.

First-Year Writing Seminars

3 credits. More than 125 different writing-intensive courses in the liberal arts. Seminars require six to twelve writing assignments on different topics, totaling a minimum of 30 pages. For other courses to be substituted, students must demonstrate that they have done similar writing in a formal course. (It is not sufficient to write, for example, one 30-page paper.) For more information, see: http://www.arts.cornell.edu/knight_institute/fws/overview.html

INFO 230 Intermediate Design & Programming for the Web

3 credits. Main emphasis is on server side processing. Students look at interactions with databases, learning about querying both on paper and via SQL, and then apply this understanding to the creation of an interactive data-driven site via the use of an integrated web site development tool, such as ColdFusion. Also considered are techniques to enhance security, privacy, reliability, and ways of incorporating other programs. Design issues are emphasized.

INFO 330 Applied Database Systems

3 credits. Introduces students to modern database systems and three-tier application development with a focus on building web-based applications using database systems. Concepts covered include the relational model, relational query languages, data modeling, normalization, database tuning, three-tier architectures, Internet data formats and query languages, server- and client-side technologies, and an introduction to data web services. Students build a database-backed web site.

Liberal Studies Courses

Courses in humanities, arts and social sciences. Six liberal studies classes/18 credit minimum (not including writing seminars) are required for graduation.

MATH 191 Calculus for Engineers

4 credits. Techniques of integration, finding areas and volumes by integration, exponential growth, partial fractions, infinite and power series.

MATH 192 Calculus for Engineers

4 credits. Calculus of functions of several variables, double and triple integrals, line integrals, vector fields, Green's theorem, Stokes' theorem, and divergence theorem.

MATH 293 Engineering Mathematics

4 credits. Ordinary and partial differential equations, Fourier series, linear partial differential equations, linear systems of ordinary differential equations.

MATH 294 Engineering Mathematics

4 credits. Linear algebra and applications. Topics: matrices, determinants, vector spaces, eigenvalues/eigenvectors, orthogonality, inner product spaces. Applications: difference equations, Markov chains, systems of linear ordinary differential equations.

MATH 304 Prove It!

4 credits. In mathematics, the methodology of proof provides a central tool for confirming the validity of mathematical assertions, functioning much as the experimental method does in the physical sciences. In this course, students learn various methods of mathematical proof, starting with basic techniques in propositional and predicate calculus and in set theory and combinatorics, and then moving to applications and illustrations of these via topics in one or more of the three main pillars of mathematics: algebra, analysis, and geometry. Since cogent communication of mathematical ideas is important in the presentation of proofs, the course emphasizes clear, concise exposition. This course is useful for all students who wish to improve their skills in mathematical proof and exposition, or who intend to study more advanced topics in mathematics.

M&AE 212 Mechanical Properties & Selection of Engineering Materials

3 credits. Mechanics of deformable bodies and a reinforcement of the concept of "simple engineering elements" for mechanical analysis associated with design. There is an introduction to the broad range of properties and behaviors of engineering materials as they relate to mechanical performance. Emphasis is placed on general states of stress and strain, on elasticity, and combined loading effects. Failure criteria including yielding, buckling, fracture, fatigue, and environmental effects are developed. A general introduction to the function/constraints/objectives approach to material selection associated with mechanical design is provided with candidate material systems coming from metals, polymers, ceramics, and/or composites. A general overview of material processing will be presented within this context of material selection.

M&AE 225 Mechanical Synthesis

4 credits. A hands-on introduction to the mechanical design process. Basic prototyping skills developed using machine tools. Mechanical dissection used to demonstrate successful product design and function. Design projects provide experience from conceptualization through prototype construction and testing. Basic instruction on CAD and technical sketching.

PHYS 112 Physics I: Mechanics

4 credits. Mechanics of particles: kinematics, dynamics, conservation laws, central force fields, periodic motion. Mechanics of many-particle systems: center of mass, rotational mechanics of a rigid body, static equilibrium. (Course is calculus-based, and includes a laboratory component.)

PHYS 213 Physics II: Heat/Electromagnetism

4 credits. Temperature, heat, thermal energy, electrostatics, behavior of matter in electric fields, DC circuits, magnetic fields, Faraday's law, Maxwell's equations, electromagnetic oscillations. (Course is calculus-based, and includes a laboratory component.)

PHYS 214 Physics III: Optics, Waves, & Particles

4 credits. Physics of wave phenomena, electromagnetic waves, interference and diffraction effects, wave properties of particles and introduction to quantum physics. (Course is calculus-based, and includes a laboratory component.)

Engineering Curriculum Overview & Requirements

The following is an overview of the minimum academic requirements for prospective transfer students to the College of Engineering. To achieve sophomore standing in a particular major, applicants must have completed *at least* the equivalent of all Cornell courses listed in the sophomore standing column. For junior standing, applicants must have completed the equivalent of all Cornell courses listed in the junior standing column, *as well as* those listed in the sophomore standing column. Please use this chart and the accompanying Cornell course descriptions as a guide when choosing courses at your current institution, and feel free to contact Engineering Admissions if you have any specific questions or concerns.

Engineering Major	Academic Requirements For Sophomore Standing	Academic Requirements For Junior Standing
Biological Engineering	MATH 191 & 192 COM S 100 (or BEE 151) CHEM 211 (or 207) PHYS 112 2 First-Year Writing Seminars	MATH 293 & 294 ENGRD 202 & 221 PHYS 213 CHEM 257 BIO G 101, 102, 103 & 104 2 Liberal Studies Courses
Civil Engineering	MATH 191 & 192 COM S 100 CHEM 211 (or 207) PHYS 112 2 First-Year Writing Seminars	MATH 293 & 294 ENGRD 202 PHYS 213 & 214* 2 Liberal Studies Courses
Chemical Engineering	MATH 191 & 192 COM S 100 CHEM 207 & 208 Biology Elective PHYS 112 2 First-Year Writing Seminars	MATH 293 & 294 ENGRD 219 CHEM 290, 389 & 390 CHEM 323 PHYS 213 2 Liberal Studies Courses
Computer Science	MATH 191 & 192 COM S 100 CHEM 211 (or 207) PHYS 112 ENGRD 211 2 First-Year Writing Seminars	MATH 294 COM S 280 & 312 PHYS 213 CHEM 208 2 Liberal Studies Courses
Electrical & Computer Engineering	MATH 191 & 192 1 of the following: (ENGRD/ECE210, ENGRD 230, ECE 220) COM S 100 CHEM 211 (or 207) PHYS 112 2 First-Year Writing Seminars	MATH 293 & 294 2 of the following: (ENGRD/ECE 210, ENGRD 230, ECE 220) PHYS 213 & 214 2 Liberal Studies Courses
Engineering Physics	MATH 191 & 192 COM S 100 CHEM 211 PHYS 112 2 First-Year Writing Seminars	MATH 293 & 294 A&EP 363 (recommended) ENGRD 264 (recommended) PHYS 213 & 214 2 Liberal Studies Courses

Engineering Major	Academic Requirements For Sophomore Standing	Academic Requirements For Junior Standing
Environmental Engineering	MATH 191 & 192 COM S 100 (or BEE 151) CHEM 207 CHEM 257 or ENGRD 251 2 First-Year Writing Seminars	MATH 293 & 294 ENGRD 202 PHYS 112 & 213 2 Liberal Studies Courses
Geological Sciences (Atmospheric Science Option)	MATH 191 & 192 COM S 100 CHEM 211 PHYS 112 2 First-Year Writing Seminars	MATH 293 & 294 EAS 131 & 250 ENGRD 270 PHYS 213 & 214 2 Liberal Studies Courses
Geological Sciences (Geoscience Option)	MATH 191 & 192 COM S 100 CHEM 211 (or 207) PHYS 112 2 First-Year Writing Seminars	MATH 293 & 294 ENGRD 201 PHYS 213 & 214* 2 Liberal Studies Courses
Geological Sciences (Science of Earth Systems Option)	MATH 191 & 192 COM S 100 CHEM 207 PHYS 112 2 First-Year Writing Seminars	MATH 293 & 294 ENGRD 201 EAS 220 PHYS 213 CHEM 208 BIO G 109 & 110 2 Liberal Studies Courses
Information Science, Systems, & Technology	MATH 191 & 192 COM S 100 CHEM 211 (or 207) INFO 230 PHYS 112 2 First-Year Writing Seminars	MATH 294 MATH 293** or one of following: (MATH 304, CS 280) ENGRD 211 & 270 PHYS 213 & 214* INFO 330 ECON 301 2 Liberal Studies Courses
Materials Science & Engineering	MATH 191 & 192 COM S 100 CHEM 211 (or 207) PHYS 112 2 First-Year Writing Seminars	MATH 293 & 294 ENGRD 261 or 262 PHYS 213 & 214 2 Liberal Studies Courses
Mechanical Engineering	MATH 191 & 192 COM S 100 CHEM 211 (or 207) PHYS 112 2 First-Year Writing Seminars	MATH 293 & 294 ENGRD 202, 203, & 221 PHYS 213 M&AE 212 & 225 2 Liberal Studies Courses
Operations Research & Engineering	MATH 191 & 192 COM S 100 CHEM 211 (or 207) PHYS 112 2 First-Year Writing Seminars	MATH 294 MATH 293** or one of following: (MATH 304, CS 280) ENGRD 211 & 270 PHYS 213 & 214* 2 Liberal Studies Courses

*Applicants may substitute CHEM 208 for PHYS 214 in this major.

**If MATH 293 is not taken, then CHEM 208 must replace PHYS 214.