Science & Engineering Majors Available at the UW

University of Washington/Undergraduate Gateway Center
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Admission requirements are subject to change. For the most current information, see www.washington.edu/uaa/gateway/advising/majors/majoff.php or contact the department adviser: www.washington.edu/uaa/gateway/advising/about/departments.php.

Many science departments offer both Bachelor of Arts and Bachelor of Science degrees. In such departments, the B.A. usually a more flexible program with fewer science requirements, while the B.S. is a more rigorous program intended to prepare you for graduate study.

Biological Sciences

major	description	admission requirements	comments
Biochemistry	Chemical processes of biological systems, including enzymology, molecular biology, and cell biology.	***Open admission.*** 2.00 GPA.	B.A. and B.S. degrees offered. B.S. requires 197 credits. Supporting coursework required in math, biology, and physics, as well as general, organic, and physical chemistry.
Biology	The study of living organisms. Cell and molecular processes, development, organismal physiology and morphology, natural history, evolution, conservation, and ecology.	***Minimum admission requirements.*** BIOL 180 with minimum 2.5 grade; or BIOL 180, 200, 220 with minimum 2.00 GPA in the three courses. In addition, minimum 2.00 GPA for all required chemistry, physics, mathematics, and biological sciences courses already completed.	B.A. in General Biology. B.S. degree with six options: General Biology; Ecology and Evolutionary Biology; Environmental and Conservation Biology; Molecular, Cellular, and Developmental Biology; Physiology; and Plant Biology. Supporting coursework required in math; general, organic, and physical chemistry; and physics.
Microbiology	Study of microorganisms (primarily bacteria and viruses), including genetics, immunology, and medical microbiology.	***Minimum admission requirements.*** 75 cr, including BIOL 180, 200, 220; CHEM 142, 152, 162; CHEM 223, 224 OR 237, 238, 239. Minimum 2.25 GPA in required BIOL and CHEM. 2.00 gpa overall.	B.S. degree only. Early admission: BIOL 180 and 200; CHEM 142, 152, 162; CHEM 223 or 237; 2.75 gpa in these courses; 2.00 gpa overall.

Neurobiology	Introduction to the study of nervous systems.	***Competitive admission.*** BIOL 180, 200, 220 with at least a 2.0 grade in each course; minimum 2.50 GPA in required chemistry, math, and physics courses completed by the time of application.	B.S. degree only. Two years necessary to complete the required N BIO sequence of courses.
Psychology	Scientific study of behavior and its causes.	***Competitive admission***. One from MATH 111, 112, 120, 124, 144 with a grade of at least 2.0; the following three PSYCH courses with a minimum 2.0 grade in each course and a minimum 2.50 GPA in the three courses: PSYCH 101, 202, 209. Must be enrolled at UW before applying to major.	B.A. and B.S. B.S. graduation requires calculus (i.e., either MATH 120+124 or MATH 120+144)

Earth Sciences

major	description	admission requirements	comments
Atmospheric Sciences	Composition and structure of the atmosphere, atmospheric chemistry, weather analysis and prediction.	***Open admission.*** 2.00 GPA.	B.S. degree only.
Earth and Space Sciences	Study of the earth, its environment, its origin, and the processes by which it has been transformed and reconstituted through time.	***Open admission.*** 2.00 GPA.	B.A. and B.S.: supporting coursework required in math, general chemistry, and physics. B.S. offers standard, biology, environmental earth sciences, and physics options.
Oceanography	The physical, geological, chemical, and biological processes in the ocean and the interactions of the ocean with the earth, the biosphere, and the atmosphere.	***Open admission.*** 2.00 GPA.	B.A. and B.S. Supporting coursework required in math, general chemistry, physics, biology, and earth and space sciences.

Engineering Sciences

Upper Division Admission for Autumn quarter (all departments). Deadline: July 1. Prerequisites are outlined in the chart below.

Upper Division Admission for Spring quarter (Bioengineering, Computer, Electrical, Industrial, Materials Science, Paper Science, and Technical Communication). Deadline: February 1. Prerequisites are outlined in the chart below.

Early Admission for Autumn quarter (all departments except Civil and Environmental Engineering and Computer Engineering). Deadline: July 1. Prerequisites for Early Admission:

- 5 credits English composition
- MATH 124, 125, 126
- 10 credits from PHYS 121, 122, 123 or CHEM 142, 152 (except Chemical Engineering, which requires CHEM 142, 152, 162, and PHYS 121, and Paper Science and Engineering, which requires CHEM 142, 152, 162).
- minimum 15 UW credits
- minimum 2.5 gpa with 2.0 in each course

Accelerated Admission for any quarter (Computer Engineering only; see below for details)

In each department, only the Bachelor of Science degree is offered.

major	description	admission requirements	comments
Aeronautics and Astronautics	Design, development, testing, and production of commercial and military aircraft, missiles, and spacecraft.	***Competitive admission***. MATH 124, 125, 126, 307, 308; CHEM 142; PHYS 121, 122, 123; 5 cr English comp, T C 231; CSE 142; AA 210; CEE 220; ME 230; CHEM E 260. In addition, MATH 324 and AMATH 301 must be taken no later than the autumn of admission. Minimum 2.0 in each prerequisite course; minimum 2.50 average in prerequisites.	
Bioengineering	The application of engineering technology to clinical practices and research. Bioinstrumentation, biomaterials, simulation of biosystems.	***Competitive admission***. MATH 124, 125, 126; CHEM 142, 152, 162; PHYS 121, 122*; BIOL 180, 200; 5 cr English comp; CSE 142*; BIOEN 201* (* courses may be in progress at time of application). Minimum 2.5 cumulative GPA.	
Chemical Engineering	Transformation of raw materials into useful products such as gasoline, pulp and paper, pharmaceuticals, and energy. Environmental processes such as waste disposal and recycling.	***Competitive admission***. MATH 124, 125, 126, 307; CHEM 142, 152, 162, 223 or 237; PHYS 121, 122, 123; 5 cr English comp; CSE 142; CHEM E 260. Minimum 2.5 average in prerequisites.	

Civil and Environmental Engineering	The planning, design, construction, and management of facilities such as airports, buildings, bridges, dams, water and sewage systems, harbors, and highways. Control and reduction of air and water pollution.	***Competitive admission***. MATH 124, 125, 126, 308; CHEM 142; PHYS 121, 122; 5 cr English comp; AMATH 301 or CSE 142; AA 210; CEE 220; ME 230. Minimum 2.0 in each prerequisite course; minimum 2.50 average in prerequisites.	
Computer Engineering	An engineering degree covering theory, design, and implementation of computer systems; students choose a hardware or software track. Areas such as databases, graphics, and networks.	***Competitive admission***. MATH 124, 125, 126; PHYS 121, 122; 5 cr English comp; CSE 142, 143. Minimum 2.50 average in prerequisites.	Accelerated Admission: CSE 142, 143; 5 additional credits from Upper Division Admission requirements; at least 15 UW credits; 3.0 cumulative GPA.
Electrical Engineering	Design, development, production, and operation of devices that use electricity. Electrical energy production and transmission, electronics.	***Competitive admission***. MATH 124, 125, 126; CHEM 142; PHYS 121, 122; 5 cr English comp. Minimum 2.5 average in prerequisites. Minimum 2.5 cumulative GPA.	
Industrial Engineering	Design of effective ways to use people, materials, machines, and energy in manufacturing and other industries.	***Competitive admission***. MATH 124, 125, 126; CHEM 142, 152; PHYS 121, 122, 123; 5 cr English comp. Minimum 2.50 average in prerequisites.	

Materials Science and Engineering	Development and manufacture of new types of polymers, hybrids, biomaterials, nanomaterials, and photonic and magnetic materials and products.	***Competitive admission***. MATH 124, 125, 126, 307; CHEM 142, 152; PHYS 121, 122; 5 cr English comp; CSE 142 or AMATH 301; MSE 170. Minimum 2.0 in each prerequisite course. Minimum 2.5 cumulative GPA.	
Mechanical Engineering	Design and manufacture of mechanical devices and systems.	***Competitive admission***. MATH 124, 125, 126; CHEM 142, 152; PHYS 121, 122; 5 cr English comp; T C 231; AA 210; CEE 220; ME 230. Minimum 2.0 in each prerequisite course Minimum 2.50 average in prerequisites.	
Paper Science and Engineering	Pulping and papermaking techniques, engineering principles of papermaking, management and business principles in an industry setting.	***Competitive admission***. MATH 124, 125, 126, 307; CHEM 142, 152, 162, 237; PHYS 121, 122; 5 cr English comp; CHEM E 260. Minimum 2.50 GPA in prerequisites.	B.S. degree only.
Technical Communication	Technical writing and editing, including computer documentation and writing for publication.	***Competitive admission***. 10 cr approved math or statistics, 15 cr approved natural science, 13 cr approved oral and written communication including T C 231. Minimum 3.00 GPA in the oral/written communication. Minimum 2.0 cumulative GPA.	50 cr approved math and natural science required for graduation. Technical Writing, a similar program, is available through Individualized Studies. ***Competitive admission***. Application must be approved by both INDIV and T C. See Individualized Studies adviser.

Mathematical and Computer Sciences

major	description	admission requirements	comments

Applied and Computational Mathematical Sciences	Applied and computational math; modelling; probability and statistics; algorithms.	***Minimum admission requirements.*** MATH 124, 125, 126; CSE 142; one of MATH 307, MATH 308, MATH 310, AMATH 351, AMATH 352. Minimum 2.50 GPA in these courses; minimum 2.0 in each course. Must be enrolled at UW before applying to major.	B.S. degree only. Eight options, including Discrete Math and Algorithms (computer applications).
Computer Science	The theory, design, and implementation of computer systems; a liberal arts degree with more flexible requirements than CE. Areas such as embedded systems, robotics, and artificial intelligence.	***Competitive admission***. MATH 124, 125, 126; CSE 142, 143; 5 cr approved natural science (usually PHYS 121 or CHEM 142); 5 cr English comp.	B.S. degree only. Accelerated Admission: CSE 142, 143; 5 additional credits from Upper Division Admission requirements; at least 15 UW credits; 3.0 cumulative GPA.
Health Informatics and Health Information Management	The collection, organization, use, and evaluation of data in health care environments.	***Competitive admission***. 90 credits, including statistics, MGMT 300, BIOL 118 and 119, CSE/INFO 100, and a course in medical terminology (not offered at the UW).	EVENING DEGREE PROGRAM ONLY
Informatics	Information systems and technology. Information management, databases, and information policy.	***Competitive admission***. CSE/INFO 100; CSE 142; STAT 311 or QMETH 201; 5 credits English composition.	B.S. degree only.
Mathematics	The study of the basic language of the physical sciences. Calculus, differential equations, linear algebra, probability, advanced theory.	***Minimum admission requirements***. MATH 124, 125, 126, plus one 300-level required MATH course. Minimum 2.0 in each required MATH course, minimum 2.00 average in all math courses. (Teaching major requires a 2.5 in each MATH course) Must be enrolled at UW before applying to major.	B.A. options: Standard, Philosophy, and Teacher Preparation. B.S. options: Standard and Comprehensive.

Statistics	Design of experiments and sampling surveys; exploration, summarization, and display of data; drawing inferences and assessing their uncertainty; mathematical models.	***Minimum admission requirements***. 45 credits, including MATH 124, 125, 126; 8 credits science (see Statistics website for list); one from STAT 220, 311, 390; 2.80 GPA in the courses listed, with a grade of at least 2.0 in each course.	B.S. degree only.

Natural Resource Sciences

major	description	admission requirements	comments
Aquatic and Fishery Sciences	The biology, ecology, conservation, management, and utilization of aquatic animals.	***Open admission.*** 2.00 GPA.	B.S. degree only. Supporting coursework required in math, general and organic chemistry, biology, and physics.
Environmental Science and Resource Management	Management, stewardship, and restoration of both wildlands and human-inhabited systems; resource management and assessment.	***Open admission.*** 2.00 GPA.	B.S. degree only. Supporting coursework required in math, chemistry, and biology.
Environmental Studies	Environmental studies from natural science, historical, socioeconomic, legal, political, and ethical perspectives. Local, regional, and global issues.	***Open admission.*** 2.00 GPA.	B.A. degree only. Supporting coursework required in biology, chemistry, and statistics.
Paper Science and Engineering	Pulping and papermaking techniques, engineering principles of papermaking, management and business principles in an industry setting.	***Competitive admission***. MATH 124, 125, 126, 307; CHEM 142, 152, 162, 237; PHYS 121, 122; 5 cr English comp; CHEM E 260. Minimum 2.50 GPA in prerequisites.	B.S. degree only.

Physical Sciences

major	description	admission requirements	comments

Astronomy	Structure, evolution, and dynamics of the solar system, stars, interstellar matter, galaxies, and the cosmos.	***Open admission.*** 2.00 GPA.	B.S. degree only. Supporting coursework required in math and physics.
Biochemistry	Chemical processes of biological systems, including enzymology, molecular biology, and cell biology.	***Open admission.*** 2.00 GPA.	B.A. and B.S. degrees offered. B.S. requires 197 credits. Supporting coursework required in math, biology, and physics, as well as general, organic, and physical chemistry.
Chemistry	The properties of substances, the changes they undergo, and the natural laws that describe these changes.	***Open admission.*** 2.00 GPA.	Standard B.S., ACS Certified B.S., and B.A. degrees offered. ACS certified B.S. requires 185 credits; standard B.S. requires 182 credits. Supporting coursework required in math and physics.
Physics	The fundamental structure of matter and the interaction of its constituents.	***Open admission.*** 2.00 GPA.	B.S. degree only. Supporting coursework required in math and other sciences.