

WILLAMETTE UNIVERSITY

Pre-engineering program (www.willamette.edu/cla/physics)

Students earn a Bachelor of Arts (BA) from Willamette University and a Bachelor of Science (BS) and/or Master's (MS) in Engineering from one of the affiliated engineering schools (AES). A BS is considered a professional degree and is required for jobs in engineering fields that require ABET certification, for example, Civil Engineering. The MS is the preferred choice for engineers working in industry or R&D.



**Columbia University
(New York, NY)**

<http://undergrad.admissions.columbia.edu/learn/academiclife/engineering/combined-plan-program>



**University of Southern California (USC)
(Los Angeles, CA)**

<http://viterbiadmission.usc.edu/threetwo/>



**Washington University
(St. Louis, MO)**

<https://engineering.wustl.edu/prospective-students/dual-degree/Pages/default.aspx>

	<i>3-2 program</i>	<i>4-2 undergrad.</i>	<i>4-2 graduate</i>	<i>3-3 Accelerated Master's</i>
<i>Offered by</i>	Columbia ¹ USC Wash. U.	Columbia Wash. U.	Columbia	Wash. U.
<i>Time investment</i>	3 years at WU 2 years at AES	4 years at WU 2 years at AES	4 years at WU 2 years at AES	3 years at WU 3 years at AES
<i>Degrees</i>	BA from WU BS from AES	BA from WU BS from AES	BA from WU MS from AES ²	BA from WU BS and MS from AES
<i>Federal financial aid</i>	Eligible throughout the full five years	Eligible at WU. Ineligible at AES. ³	Eligible at WU. No TA/RA at Columbia.	Eligible at WU. Ineligible at Wash. U. ⁴

¹ Guaranteed admission with Columbia if all their requirements are fulfilled if you started at Willamette in the fall of 2018 or earlier. **Starting in the fall of 2019, Columbia no longer offers guaranteed admission.**

² WU Major must be in either Mathematics, Physics, Chemistry, or other physical science. Limited degree options at Columbia (biomedical, chemical, civil, computer science, Earth and environmental, electrical, industrial, and mechanical engineering; applied physics; applied mathematics; engineering mechanics; operations research; and materials science).

³ Unless WU degree has been delayed (federal financial aid ends after completion of the first Bachelor's degree).

⁴ All admitted students pay discount tuition reduced 50% the first year, 55% the second, and 60% the third year.

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Students must make significant progress toward their major (typically all courses except senior year courses – in physics, minimum is six courses) and make arrangements with their major advisor and the registrar to transfer credit back from the AES to count toward the major.

Almost all WU majors except chemistry and anthropology are possible for the 3-2 program. The most compatible choices are Physics (best match), Math, or CS.

Students must complete Willamette’s general education requirements.

Never take pre-engineering courses pass/fail (CR/NC). Required pre-engineering courses must be completed with a B or better to make you eligible for guaranteed admission with Columbia:

<i>Math</i>	<i>Physics</i>	<i>Chemistry</i>	<i>Computer Science</i>
Calculus through Differential Equations	Physics I and II (Phys221 and 222)	Chemistry I (Chem115)	One programming language course. ⁵

Students must maintain both an overall and pre-engineering specific GPA of currently 3.00 for USC, 3.25 for Wash. U., and 3.30 for Columbia. **Note that for students starting in the fall of 2019 or later, Columbia’s GPA will be 3.60.**

Scholarships must be re-negotiated. They do not transfer from WU to the AES.

If you fulfill all requirements, admission is pretty much guaranteed. Over the last 26 years, only one student was not admitted because they didn’t fulfill the requirements.

Columbia requires a Principles of Economics course (e.g. ECON 132).

Columbia’s 4-2 graduate program: Each applicant must produce evidence of an outstanding undergraduate record, including superior performance in physics and mathematics through differential equations. The program of study will be individually designed in consultation with a faculty adviser and will integrate undergraduate work with the field of engineering or applied science the student chooses to follow. During the first year, the program will consist primarily of basic undergraduate courses; during the second year, of graduate courses in the selected field.

⁵ Different engineering majors prefer different languages, such as C++, Matlab, Python, or Java. See the AES’s curriculum guides!

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<i>Columbia</i>	<i>USC</i>	<i>Wash. U.</i>
Application deadline: February 15th of Junior year	Application deadline: February 1st of Junior year	Application deadline: February 28th of Junior year
Applied Mathematics or Applied Physics	Aerospace Engineering	Biomedical Engineering
Biomedical Engineering	Mechanical Engineering (emphasis on Petroleum possible)	Chemical Engineering
Chemical Engineering	Astronautical Engineering	Computer Engineering
Civil Engineering	Biomedical Engineering (emphasis on Biochemical or dual degree with Electrical or Mechanical Engineering possible)	Computer Science
Computer Engineering	Chemical Engineering (emphasis on Biochemical, Environmental, Petroleum, Polymers/Material Science, Sustainable Energy possible)	Electrical Engineering
Earth and Environmental Engineering	Civil Engineering (emphasis on Structural, Environmental possible)	Mechanical Engineering
Electrical Engineering	Environmental Engineering	System Science & Engineering
Engineering Mechanics	Computer Engineering/Computer Programming	
Industrial Engineering, Engineering Management Systems, or Operations Research	Electrical Engineering	
Materials Science and Engineering	Industrial Systems Engineering (emphasis on Operations or Information Systems)	

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What can you do?

- **Meet with one of the pre-engineering advisers (Profs. Altman, Kleinert, Watkins in physics, or McNicholas in math) regularly and early (freshman year!) and fill out a pre-engineering interest form.**
- Check engineering school websites for up to date information and requirements.
- Decide which engineering major you want to pursue (requirements are different for different majors!) and map out your schedule while here at WU. Your pre-engineering advisor will be happy to help you with this!



Pre-Engineering Interest

Student Name: _____ ID #: _____

Current Advisor(s): _____

In addition to my Bachelor of Arts degree at Willamette University, I am interested in pursuing a degree in Engineering at a partner institution. Please assign Professors Michaela Kleinert and Richard Watkins as additional advisors for me.

I am interested in the Engineering program at:

- Columbia University, New York
- University of Southern California, California
- Washington University, Missouri
- I'm not sure yet which specific program I'm interested in, but definitely one of them!

Signature: _____ Date: _____

Alternative career options:

- Physics Bachelors are very employable; see e.g. www.aps.org and click on *Careers in Physics*.
- The University of Oregon offers a great program (Master's Industrial Internship Program, <http://internship.uoregon.edu/>) that prepares students for a career in industry (1-year program resulting in a master's degree and 9-months industrial internship experience).