

# Combined Plans

## Engineering

*Advisor: Fred Moore (Physics)*

Note: In December 2016 Whitman formally launched its own 4-year bachelor's degree in Computer Science. The Computer Science option via Whitman's Combined Plan has been eliminated and those admitted with the class of Fall-2017 were the final students eligible for it. Computer Engineering remains an option through this program.

Note: In August 2018 Columbia University discontinued its program of 'guaranteed admission' to Whitman students meeting its coursework and GPA criteria. The last students eligible for this program were those admitted for Fall 2018. Washington University in St. Louis continues to offer a path to guaranteed admission.

Whitman College is associated with Caltech, the Fu Foundation School of Engineering and Applied Science at Columbia University, the School of Engineering and Applied Science at Washington University in St. Louis, and the University of Washington School of Engineering in combined programs for liberal education in engineering and related degrees (e.g. operations research). In addition, with consultation and approval from the program advisor and the program's advisory committee, students may be able to arrange individual programs combining liberal education with study in engineering at another non-associated but ABET-accredited department of engineering.

Typically, the combined plans require five years of study. The first three years are spent at Whitman College, and the last two years are spent at the engineering school, where the student completes courses in one of the branches of engineering or operations research, etc. At the University of Washington and at nonaffiliated institutions, more than two years may be necessary to complete the second phase of the combined plan program. Students who transfer to Whitman as candidates for the combined plan must complete a minimum of two years in residence at Whitman and satisfy appropriate modifications of the requirements outlined below. In the combined plan, two degrees are awarded upon successful completion of the program: the degree of Bachelor of Arts, with a major in Chemistry/Pre-Engineering, Mathematics/Pre-Engineering, Physics/Pre-Engineering or BBMB/Pre-Engineering (Biophysics, Biochemistry and Molecular Biology) by Whitman College; and a second Bachelor's degree, with a major in engineering or a related field, by the transfer institution. The requirements for the combined plan are given below in the section titled *3/2 Program Requirements*. Also note the information in the section titled *Notes and Cautions*.

This combined program requires very careful scheduling—even a semester's delay in starting the program may preclude a student from being prepared to transfer after their third year. Students who are interested in chemical, mineral, metallurgical, or biomedical engineering should take Chemistry 140 (or 125, 126, 135, and 136) and calculus during their first year. Students who are interested in other branches of engineering should take Physics 155 and calculus during their first year. The nuances of the requirements at different partner schools mean that students should consult with the 3/2 program advisor before finalizing their first semester schedule. Consultations should continue regularly thereafter, before each subsequent semester, to ensure proper progress in the program.

Students must declare their intent to complete the 3/2 program before the end of their fourth semester in residence at Whitman in order to be eligible to transfer to another institution to complete the program. Student who came to Whitman via a transfer process must declare their intent before the end of their second semester in residence at Whitman. Students will have the Engineering program advisor as a major advisor, as well as an advisor from the relevant department (Chemistry, Mathematics, Physics, or BBMB).

### **3/2 Program Requirements**

- 62 Credits at Whitman and 93 credits overall
- Required Courses for all programs
  - Computer Science 167

- Mathematics 225 and 244
- Physics 145 or 155 and 156
- Chemistry 125 and 135 (or 140)
- Other program requirements
  - Earn at least 93 credits at Whitman and complete three years
    - Transfers finish 62 credits at Whitman and complete two years
  - Have a Whitman GPA of 2.0
  - Complete Whitman General Studies requirements

### CHOOSE

- **Physics/Pre-Engineering:**
  - Required courses
    - Mathematics 240
    - Physics 245, 255, and 267
    - 6 credits of 300/400 level physics
- **Chemistry/Pre-Engineering:**
  - Required courses
    - Chemistry 245, 246, 251, 252, 310, 345
    - Either Chemistry 320 or both 346 and 352
- **Mathematics/Pre-Engineering:**
  - Required courses
    - Mathematics 240, 260
    - Computer Science 270
    - 6 credits of Mathematics at 200 level or above
  - Other notes
    - Mathematics 358 and 247 are recommended
    - Need a cumulative GPA of 2.5 or greater in Mathematics
- **BBMB/Pre-Engineering:**
  - Required courses
    - Biology 111, 205; Chemistry 126,136 (or 140), 245, 246, 251, and 252
    - Choose two: BBMB 324 and 334, or 325 and 335, or 326 and 336
- Other notes
  - Students who are interested in chemical, mineral, metallurgical, or biomedical engineering should take Chemistry 140 (or 125, 126, 135, and 136) and calculus during their first year.
  - Students who are interested in other branches of engineering should take Physics 155 and calculus during their first year.

The aforementioned four tracks reflect the Whitman degree that the student will receive on successful completion of the program. The Physics/Pre-Engineering track typically requires the student to complete a degree in a physical branch of engineering, industrial engineering, operations research or a closely related field at the partner school. The Chemistry/Pre-Engineering track typically requires a chemical engineering degree at the partner school. The Mathematics/Pre-Engineering track typically requires a degree in computer engineering or operations research at the partner school. The BBMB/Pre-Engineering track requires a degree in biomedical engineering or bioengineering at the partner school.

- Complete the requirements for a degree in a field of engineering (or a related degree) at one of the affiliated institutions — Caltech, Columbia University, Washington University in St. Louis, and the University of Washington — or in any other ABET-accredited program in the United States.

## Notes and Cautions

- I. Three of the four affiliated institutions (but not the University of Washington) require that students seeking admission secure a recommendation from the 3-2 program advisor. Even with a recommendation from the 3-2 program advisor, admission to some of the affiliated institutions is not guaranteed. Under normal

circumstances, to secure a recommendation from the 3-2 program advisor at Whitman and to be admitted to any of the four affiliated programs, students will need cumulative and mathematics-science grade-point averages of at least 3.0. Washington University in St. Louis offers guaranteed admission to students who are recommended by the 3-2 program advisor at Whitman, take the prerequisite mathematics and science courses, satisfy their general education and credit requirements and meet an elevated GPA standard.

- II. Nearly all institutions have higher (than 2.0) overall and mathematics-science GPA requirements for transfer admission, and/or additional course, credit, or general education requirements. Here are two examples: 1) Along with additional requirements that depend on the intended program (e.g., civil engineering, electrical engineering), Columbia University requires that students spend “approximately” three years at Whitman, and take the equivalents of Economics 100 or 101 or 102, and RWPD 170 (or 210). 2) Caltech recommends (strongly) that ALL 3-2 program students (regardless of which track the individual is following) to take Physics 245, 255.
- III. Students receive a Whitman College degree after completing requirements above and, in particular, after receiving a Bachelor’s degree with a major in the appropriate field from an affiliated institution or from a nonaffiliated but ABET-accredited program. Completing a degree in a nonaffiliated program or at the University of Washington may take more than two years.
- IV. The Whitman pre-engineering majors are only awarded to students who successfully complete their 3/2 program. If a student does not receive a degree from a transfer institution, he or she must satisfy the requirements for a non-pre-engineering Whitman College major in order to graduate from Whitman and may need to keep this possibility in mind as they schedule courses at Whitman.
- V. Individuals interested in biomedical engineering should be aware that the required pre-engineering coursework (i.e., classes to be completed at Whitman) varies widely from one partner institution to another. In particular, a student wanting to do biomedical engineering at Columbia should consider following the Physics track at Whitman and supplementing those courses to complete Columbia's requirements. In contrast, a student wanting to do biomedical engineering at Washington University in Saint Louis should follow the BBMB track at Whitman. Clearly, anyone wanting to pursue biomedical engineering should be in close contact with Whitman's 3/2 advisor.

## Forestry and Environmental Management

*Advisors: Nicholas Bader (Geology-on Sabbatical, Spring 2021); Tim Parker (Biology)*

Whitman College has an association with the Nicholas School of the Environment at Duke University, Durham, N.C. The Cooperative College Program is designed to coordinate the education of students at Whitman College with graduate programs in the broad area of resources and environment offered at Duke University. Participating students are accepted into either of two degree programs, the Master of Forestry (M.F.) or the Master of Environmental Management (M.E.M.). The cooperative program is designed to accommodate students after three years of study at Whitman or upon graduation from Whitman. Duke requires applicants to take the Graduate Record Exam (general test without any advanced subject tests) in October or December of the year prior to the desired year of entrance. Those students who complete the necessary qualifications and who choose to enter Duke after three years may qualify for one of the professional master’s degrees with four semesters at Duke, in which at least 48 credits are earned. Upon completion of the requirements of the Duke program, the student will be awarded the Bachelor of Arts degree in the appropriate field by Whitman College. See the Nicholas School of the Environment website, [www.nicholas.duke.edu](http://www.nicholas.duke.edu), for additional information.

The major for the Whitman degree will be biology or geology, depending on the courses taken at Whitman. The specific requirements to be completed at Whitman College are as follows:

- Required Courses
- Other program requirements

- Two years of residence at Whitman and a minimum of 94 credits
- Duke requires applicants to take the Graduate Record Exam in October or December of the year prior to desired year of entrance
- Must obtain a recommendation from the Duke/Whitman 3-2 Committee. Duke makes final decision on admissions

### Choose

- **1. Biology**
  - 22 credits in biology
  - Required courses
    - Biology 111, 122, and 205
    - Chemistry 125, 126, 135, 136 (or 140)
    - Economics 102
    - Mathematics 125
  - Other requirements
    - Biology 215 or 277
    - 8 credits of biology 200 level or above
    - Economics 100 or 101
    - Geology 125, 110, or 120
    - Statistics course
  - Other notes
    - Highly recommended: Computer Science 167, Economics 307, a year of physics
- **2. Geology**
  - 22 credits in geology
  - Required courses
    - Geology 227 and 350
    - Biology 111 and 112
    - Chemistry 125, 126, 135, 136 (or 140)
    - Economics 102
    - Mathematics 125
  - Other major requirements
    - Geology 125, 110, or 120
    - 10 credits in geology above 200 level
    - Economics 100 or 101
    - Statistics course
  - Other notes
    - Strongly recommended: Biology 215 or 277, Computer Science 167, Economics 307, and a year of physics
- **Honors**
  - Students must submit a proposal for their thesis or project
    - Must be submitted within the first six weeks of the two-semester period in which student is eligible
  - To be eligible a student must
    - Have 87 credits
    - Completed two semesters at Whitman
  - Once approved, the registrar will be notified by the department
  - Cumulative GPA 3.300
  - Major GPA 3.500
  - Write a thesis graded A or A- by the department faculty
  - Pass the senior assessment with distinction
  - An acceptable digital copy of the Honors Thesis must be submitted to Penrose Library no later than Reading Day

## **Oceanography**

*Advisors: Nicholas Bader (Geology-on Sabbatical, Spring 2021) and Kate Jackson (Biology-on Sabbatical, Fall 2020)*

Whitman College is associated with the School of Oceanography of the University of Washington in a program for liberal education in biological or geological oceanography. The plan requires five years of study; typically three years at Whitman College and two years at the University of Washington. Students complete a Bachelor of Arts degree in either Biology or Geology from Whitman College and a Bachelor of Science in Oceanography from the University of Washington. At Whitman College, all candidates must complete the appropriate requirements outlined below, receive a recommendation from Whitman College, and apply as transfer student to the University of Washington.

This plan requires careful scheduling. Students must declare one of these majors by the end of their fourth semester in residence at Whitman College (transfer students must declare at the end of their second semester in residence at Whitman College). Interested Whitman students should contact the Whitman Oceanography advisor in their first year at Whitman, and the University of Washington Oceanography academic advisor (Michelle Townsend, mtown@uw.edu) when they apply for transfer to coordinate with the admissions office, and to answer questions about course planning.

In order to secure a recommendation from Whitman, a student must satisfy the following requirements during his or her three years at Whitman:

- **Required Courses**
  - Mathematics 125 and 126
  - Chemistry: 125, 126, 135, 136 (or 140), and 245
  - Biology 111 and 112
- **Other program requirements**
  - 94 credits and spend three years at Whitman
    - 62 credits and two years for transfer students
  - Whitman GPA of at least 3.0.
  - Complete the First-Year Experience
  - Complete the General Studies Distribution Requirements
  - Mathematics 225 or approved statistics course
  - Geology: 110, 120, or 125
  - Physics: 155 and 156;
    - or the Physics 121, 122, 123 series at the University of Washington;
    - or Physics 155 at Whitman College and Ocean 285 at the University of Washington

#### Choose

- **1. Biology**
  - Required courses
    - Biology 205
    - Chemistry 245
  - Other requirements
    - One course at Whitman from each of the three upper division Biology and/or BBMB courses
      - Molecular/Cell, Organismal, and Ecology/Evolution
    - At UW, they must take at least seven semester-equivalent credits of upper-division biology electives
    - UW three semester-equivalent credits of independent research
    - Biology GRE and attain a score sufficient to satisfy Whitman's requirements
  - Other notes
    -
- **2. Geology**
  - Required courses
    - Geology 227, 350, 358, 368
  - Other major requirements
    - Four+ geology level 300 and above at Whitman College
    - At UW, they must take at least 12 semester-equivalent credits of upper-division geology electives; and

- Geology department written major examination and attain a score sufficient to satisfy Whitman's requirements
  - Other notes
- Other notes
  - For science and math requirements must have a cumulative GPA of 3.0
  - Strongly recommended to take a geology course related to oceanography
  - Honors
    - Students must submit a proposal for their thesis or project
      - Must be submitted within the first six weeks of the two-semester period in which student is eligible
    - To be eligible a student must
      - Have 87 credits
      - Completed two semesters at Whitman
    - Once approved, the registrar will be notified by the department
    - Cumulative GPA 3.300
    - Major GPA 3.500
    - Write a thesis graded A or A- by the department faculty
    - Pass the senior assessment with distinction
    - An acceptable digital copy of the Honors Thesis must be submitted to Penrose Library no later than Reading Day