

B.S. IN PHYSICS/B.S. IN ENGINEERING

College of the Sciences and Mathematics

Curriculum

Code	Title	Credits
GENERAL EDUCATION REQUIREMENTS (http://catalog.wcupa.edu/undergraduate/general-education-requirements/)		
Academic Foundations		
	First Year Experience requirement	4
	English Composition requirement	6-7
	Mathematics requirement	3-4
	Interdisciplinary requirement	3
	Diverse Communities requirement	3
	Ethics requirement	3
Distributed Disciplinary Foundations		
	Science requirement	6-8
	Behavioral & Social Science requirement	6
	Humanities requirement	6
	Arts requirement	3
ADDITIONAL BACCALAUREATE REQUIREMENTS (http://catalog.wcupa.edu/undergraduate/general-education-requirements/)		
University Requirements		
	Writing Emphasis requirement	9
	Speaking Emphasis requirement	9
Degree Requirements		
	Capstone requirement	1-15
MAJOR REQUIREMENTS		
Major Courses		
PHY 170	Physics I	4
PHY 180	Physics II	4
PHY 175	Computational Physics	3
PHY 240	Introduction to Modern Physics	3
PHY 300	Mechanics ¹	3
PHY 310	Intermediate Physics Lab: Experimental Methods & Scientific Communication ¹	3
BME 120	Introduction to Computer Aided Engineering Design	3
BME 220	Statics	3
	An additional nine credits in physics at or above the 300 level must be chosen, depending on the engineering area selected. ¹	9
Related/Cognate Requirements ²		
MAT 161	Calculus I	4
MAT 162	Calculus II	4
MAT 261	Calculus III	4
MAT 315	Differential Equations and Linear Algebra ³	3
CHE 103	General Chemistry I	3
CHE 104	General Chemistry II	3
CRL 103	General Chemistry I Lab	1
CRL 104	General Chemistry II Lab	1
Capstone Requirement		

PHY 455	Advanced Physics Lab: Experimental Methods & Scientific Communication ^{1,4}	3
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Total Minimum Credits Required **120**

- ¹ Physics courses at the 300-level or higher must be completed with a grade of C or better.
² Some of these courses may meet general education requirements.
³ Students may also take both MAT 311 and MAT 343.
⁴ This course fulfills the Capstone requirement.

Sample Course Plan

To track their individual degree progress, students are advised to access their Degree Progress Report (DPR) via myWCU regularly. For more information, visit wcupa.edu/DegreeProgressReport (<http://wcupa.edu/degreeprogressreport/>).

The following is a sample suggested course sequence for this program; course offerings and availability are not guaranteed. Students should consult their academic advisor with any questions.

Cooperative Physics-Engineering Dual-Degree Programs

B.S. in Physics, West Chester University and B.S. in Engineering from Case Western Reserve University, Columbia University, Pennsylvania State University, or Philadelphia/Jefferson University

Course	Title	Credits
Year One		
Semester One		
MAT 161	Calculus I	4
ECO 111	Principles of Economics (Macro)	3
WRT 120	Effective Writing I	3
or	or Effective Writing with Supplemental	
WRT 123	Writing Workshop	3
FYE 100X	First Year Experience	4
Arts Gen Ed		3
Credits		17
Semester Two		
PHY 170	Physics I	4
BME 120	Introduction to Computer Aided Engineering Design	3
MAT 162	Calculus II	4
WRT 2XX	200-Level WRT Course ¹	3
Humanities Gen Ed		3
Credits		17
Year Two		
Semester Three		
PHY 180	Physics II	4
BME 220	Statics	3
MAT 261	Calculus III	4
CHE 103	General Chemistry I	3
CRL 103	General Chemistry I Lab	1
Credits		15
Semester Four		
PHY 175	Computational Physics	3
PHY 240	Introduction to Modern Physics	3
MAT 315	Differential Equations and Linear Algebra	3
CHE 104	General Chemistry II	3
CRL 104	General Chemistry II Lab	1

Interdisciplinary Gen Ed		3
Credits		16
Year Three		
Semester Five		
PHY 300	Mechanics	3
PHY 310	Intermediate Physics Lab: Experimental Methods & Scientific Communication	3
PHI 180	Introduction to Ethics	3
PHY XXX	Physics Elective ¹	3
Science Gen Ed		3
Credits		15
Semester Six		
PHY 455	Advanced Physics Lab: Experimental Methods & Scientific Communication	3
PHY XXX	Physics Elective ¹	3
PHY XXX	Physics Elective ¹	3
3-2 Elective ¹		3
3-2 Elective ¹		3
Credits		15
Total Credits		95

¹ Courses should be selected to fulfill program specific requirements. See appendix in the student handbook for physics majors.

1. Majors will not be permitted to repeat any physics courses more than once.
2. Upper-level courses (numbered 300 or above) must be completed with a grade of C or higher.
3. MAT 161, MAT 162, PHY 170, and CHE 103/CRL 103 must be completed with a grade of C or higher.

Transfer to Pennsylvania State University or to Philadelphia/Jefferson University is contingent upon recommendation by the department and having a minimum GPA of 3.0.

Note: The program with Penn State is not available to transfer students and must be completed in three years. These restrictions do not apply to the program with Philadelphia/Jefferson University. In addition, Penn State is currently **not** accepting 3+2 students into Aerospace Engineering, Architectural Engineering, Bio-engineering, Chemical Engineering, Civil Engineering, Computer Engineering, Industrial Engineering, Mechanical Engineering, Nuclear Engineering, Petroleum and Natural Gas Engineering.

Students intending to enroll in Electrical Engineering should take PHY 330 and PHY 430.

Course recommendations for students matriculating to Case Western Reserve University:

- Students are encouraged to take PHY 370 as a physics elective.
- Each specific engineering major has unique additional **recommended** courses. Students should consult the website for the Dual Degree Program at Case Western pertaining to their major of interest for other recommended courses. Note: if these courses cannot be fulfilled, they will be integrated into the curriculum, which may possibly extend the program timeline.

Course recommendations for students matriculating to Columbia University:

- Students should consult the document titled *The Combined Plan Program at Columbia University* for information about foundational and major-specific prerequisite coursework that must be completed at WCU. Some of the engineering majors have three or more

major-specific prerequisite courses, which may require an additional course to be taken during one of the semesters.

Course recommendations for students matriculating to Pennsylvania State University:

- The 3-2 elective courses should be selected to satisfy course requirements at Penn State. Recommended courses: ENG 371, an art course, a health course, or a course that fulfills the requirement of a particular major. See Penn State's "Check Sheet."

Course recommendations for students matriculating to Philadelphia/Jefferson University:

- Diversity Course Recommendation: A class considered a Global Diversity (GDIV) class or an American Diversity (ADIV) class should be selected. Course areas considered as GDIV include Cultural Anthropology, World or Comparative Religions, Cultural Geography, Foreign Language, or World Literature (literature with a global focus). Course subjects considered as ADIV include U.S. Literature, African-American History, African-American Literature, American Studies, or other specialized courses that focus on U.S. minority populations.
- PHI 180 and a second diversity course (whatever was not taken--ADIV or GDIV--in the "J" course slot). The third 3-2 elective course can be any 3-credit course.
- Students intending to enroll in mechanical engineering should take PHY 330, PHY 350, and PHY 370.