Dual Degree Program in Physics and Engineering

Major requirements

This is a special dual degree program which enables a student to receive both a Bachelor of Science degree (physics major) from UW-La Crosse and a Bachelor of Science degree (engineering major) from UW-Madison, UW-Milwaukee, UW-Platteville, UW-Stout, the University of Minnesota Duluth, or Winona State University. The total length of time for both degrees is expected to be five years, with approximately three years at UW-La Crosse (dating from enrollment in MTH 207 Calculus I (5 cr.)) and approximately two years at the partner institution. During the first three years, students will complete general education and college core requirements, engineering prerequisite course work, and many of the requirements for the physics major.

Engineering discipline and physics

Students wishing a dual degree in an **engineering discipline and physics** must complete a minimum of 85 credits at UW-La Crosse, including the following:

Code	Title	Credits
General education courses		
ECO 110	Microeconomics and Public Policy (recommended)	3
ECO 120	Global Macroeconomics (recommended)	3
ECO 336	Women in the U.S. Economy (recommended)	3
Math and chemistry courses		
CHM 103	General Chemistry I	5
CHM 104	General Chemistry II	5
MTH 207	Calculus I	5
MTH 208	Calculus II	4
MTH 309	Linear Algebra	4
MTH 310	Calculus III: Multivariable Calculus	4
Physics core		
PHY 203	General Physics I [1]	4
or PHY 103	Fundamental Physics I	
PHY 204	General Physics II [1]	4
or PHY 104	Fundamental Physics II	
PHY 305	General Physics III	3
PHY 306	Modern Physics	3
PHY 311	Experimental Physics	2
Select additional courses, depending on the specific engineering discipline, from the following:		
PHY 308	Optics	
PHY 320	Statics	
PHY 321	Classical Mechanics	
PHY 332	Electrodynamics	
PHY 334	Electrical Circuits	
PHY 335	Electronics	
PHY 343	Thermodynamics	

[1] PHY 203 and PHY 204 preferred.

Additional courses, such as the following, may be required depending on the specific engineering discipline – be sure to consult the Physics Department dual degree advisor for details.

Code	Title	Credits
BIO 105	General Biology	4
CS 120	Software Design I	4
STAT 245	Probability and Statistics	4
MTH 353	Differential Equations and Dynamical Systems	3

Students wishing a dual degree in **chemical engineering and physics** must also complete CHM 301 Analytical Chemistry (5 cr.).

Biomedical engineering and physics

Students wishing a dual degree in **biomedical engineering and physics** must complete a minimum of 85 credits at UW-La Crosse, including the following:

Code	Title	Credits
General education courses		
ECO 110	Microeconomics and Public Policy (recommended)	3
ECO 120	Global Macroeconomics (recommended)	3
ECO 336	Women in the U.S. Economy (recommended)	3
CHM 103	General Chemistry I (required)	5
Math and chemistry courses		
CHM 104	General Chemistry II	5
MTH 207	Calculus I	5
MTH 208	Calculus II	4
MTH 309	Linear Algebra	4
MTH 310	Calculus III: Multivariable Calculus	4
Physics core		
PHY 203	General Physics I [1]	4
or PHY 103	Fundamental Physics I	
PHY 204	General Physics II [1]	4
or PHY 104	Fundamental Physics II	
PHY 305	General Physics III	3
PHY 306	Modern Physics	3
PHY 311	Experimental Physics	2
Additional specified courses in biology, chemistry, microbiology, mathematics, and physics		

[1] PHY 203 and PHY 204 preferred.

Additional information

Students who express interest in the dual degree program will be selected for entrance into the UW-Madison, UW-Milwaukee, UW-Platteville, UW-Stout, University of Minnesota Duluth, or Winona State University portion of the program based on their GPA in all coursework; their GPA in the chemistry, computer science, mathematics, and physics coursework required by the program; and the positive recommendation of the UW- La Crosse Physics Department Chair (or designee). The dual degree engineering agreement with UW-Madison has additional requirements for eligibility, including Wisconsin resident status and that

students must have enrolled in UW-La Crosse from high school (rather than transferring to UWL).

In order to receive the B.S. degree from UW-La Crosse, dual degree students also must complete the remaining 35 credits (to total a minimum of 120 credits) in engineering at the partner institution and transfer these credits to UW-La Crosse. For the typical student, the remaining 35 credits must include at least 15 credits at the 300-level or above and at least 13 credits from the engineering college or institute. This transfer of credits and awarding of the B.S. degree by UW-La Crosse can take place as soon as the student earns the necessary credits.

Degree requirements

All students must complete the general education, college core, major/minor, and university degree requirements in order to qualify for a degree. The easiest way to track all of these requirements is to refer to the Advisement Report (AR) found in the Student Information System (WINGS) Student Center. All enrolled students have access to the AR.

- General education (http://catalog.uwlax.edu/undergraduate/generaleducation/)
- College core (p. 2)
- Baccalaureate degree requirements (p. 2)

College of Science and Health (CSH) Bachelor of Science core requirements

B.S. and B.A. students graduating from the College of Science and Health are required to take two natural laboratory science courses selected from the general education laboratory science category (GE 05) and/or from BIO 203, BIO 304, BIO 210, CHM 104, GEO 221, GEO 222, PHY 104 or PHY 204, and they either must take two mathematics courses or one math course and one computer science course from the math/logical systems category of the general education requirements (GE 02). One of the two science courses must be from a department outside of the student's major department.

Note: Math courses can be pairs, i.e. 150 and 151; MTH/CS majors can use two science courses from same department.

For the Bachelor of Science degree, in addition to all other College of Science and Health core requirements, students from non-exempted programs[1] must complete one of the following options. It is recommended that courses are selected in consultation with students' academic advisor.

1. Complete a second major; or
2. Complete a minor outside the major; or
3. Complete two certificates outside the major with at least 12 combined credits at the 300/400 level; or
4. Complete an individualized option, consisting of 18 credits
   a. At least 12 credits must be earned at the 300/400 level outside the major department.
   b. The remaining six credits should come from
      i. 100 level or higher courses outside the major (General education courses may apply provided they are not being used to fulfill minimum general education requirements.); or
      ii. 300/400 level courses inside major not being used to fulfill major requirements.
   c. Internship credits may not count toward the individualized option.

[1] The list of exempted CSH programs is below.

Baccalaureate degree requirements

Candidates for the Bachelor of Arts or the Bachelor of Science degrees must accomplish the following:

1. Fulfill the general education requirements.
2. Complete at least one ethnic studies (diversity) course.
3. Complete the courses prescribed by the Undergraduate Curriculum Committee for the degree desired in the respective school or college.
4. Earn a minimum of 120 semester credits with at least a 2.00 cumulative GPA.[1, 2]
5. At least 40 credits must be earned in 300/400 level courses. Transfer courses earned or transferred at the 300/400 level apply to this requirement.
6. Complete major and minor requirements with at least a 2.00 GPA[1, 2] in each major and minor (and concentration or emphasis, if selected).
7. A minimum of 30 semester credits in residence at UWL is required for graduation. (See undergraduate resident requirement (http://catalog.uwlax.edu/undergraduate/academicpolicies/graduation/#undergraduate-residence-requirement).)
8. Submit an application for graduation via the "Apply for Graduation" link in the WINGS Student Center as soon as the student has registered for his or her final semester or summer term in residence. December and winter intersession graduates should apply by May 1. May and summer graduates should apply by December 1.

[1] Grade point average requirements for some programs will be considerably higher than 2.00. Re-entering students may be required to earn credits in excess of the 120 needed for graduation in any curriculum in order to replace credits earned in courses in which the content has changed substantially in recent years. Each case will be judged on its own merit.

[2] The grade point average recorded at the time the degree is awarded will not be affected by future enrollment.

No degree will be awarded unless all requirements are fulfilled and recorded within 30 days after the official ending date of each term.

Sample degree plan

Below is a sample degree plan that can be used as a guide to identify courses required to fulfill the major and other requirements needed for degree completion. A student's actual degree plan may differ depending on the course of study selected (second major, minor, etc.). Also, this sample plan assumes readiness for each course and/or major plan, and some courses may not be offered every term. Review the course descriptions or the class timetable (http://www.uwlax.edu/records/registration/) for course offering information.

The sample degree plans represented in this catalog are intended for first-year students entering UWL in the fall term. Students should use the Advisement Report (AR) in WINGS (https://wings.uwlax.edu) and work closely with their faculty advisor(s) and college dean's office

to ensure declaration and completion of all requirements in a timely manner.

General Education Program

The general education curriculum (Gen Ed) is the common educational experience for all undergraduates at UWL. Sample degree plans include Gen Ed placeholders to ensure completion of the general education requirements. Courses may be rearranged to fit the needs or recommendations of the student's program of study. Gen Ed courses may be taken during winter term (January between the semesters) and summer to reduce the course load during regular terms (fall and spring). Students should consult with their advisor and/or the college academic services director in their college/school for assistance with course and schedule planning. Refer to the general education requirements (http://catalog.uwlax.edu/undergraduate/generaleducation/) for more specific details.

At least 40 credits of the 120 credits required must be earned at the 300/400-level.

Note: New students and transfer students with less than 12 credits earned are required to take FYS 100 First-Year Seminar (3 cr.) during one of their first two semesters at UWL.

This sample degree plan does not establish a contractual agreement. It identifies the minimum requirements a student must successfully complete, to qualify for a degree, in a format intended to assist the student in planning their academic career. Actual degree plans may differ.

Year 1

Fall	Credits	Spring	Credits
PHY 203 (Gen Ed Natural Lab Science)	4	PHY 204	4
MTH 207 (Gen Ed Math)	5	MTH 208 (Gen Ed Math)	4
ENG 110 or 112 (Gen Ed Literacy-Written)	3	CST 110 (Gen Ed Literacy-Oral)	3
PHY 497	1	PHY 497	1
Gen Ed Health & Well-Being	3	FYS 100 (Gen Ed First-Year Seminar)	3
	16		**15**

Year 2

Fall	Credits	Spring	Credits
PHY 305	3	PHY 306	3
MTH 310	4	PHY 334	3
ECO 110 (Gen Ed Self & Society)	3	PHY 308	3
CHM 103	5	MTH 309	4
Gen Ed Arts	2-3	Gen Ed Humanistic Studies	3
	17		**16**

Year 3

Fall	Credits	Spring	Credits
PHY 311	2	PHY 343	3
PHY 335 (or other elective course)[1]	4	ECO 120 (Gen Ed Global Studies)	3
ECO 336 (Gen Ed Minority Cultures)	3	CS 120 (Gen Ed Lang/Logical Systems)	4
CHM 104	5	Gen Ed Arts	2-3
		Gen Ed World History	3
	14		**15**

Year 4

Fall	Credits
Transfer to Engineering Program at UW-Milwaukee, Madison, Platteville, Stout, UM-Duluth or Winona State University. Credits completed in the Engineering Program transfer back to UWL to complete requirements for the UWL degree.	
	0

Total Credits: 93

[1] Students should consult with their physics advisor when choosing elective course.