

Recommended Fall 2022 Freshman Course Schedule for Physics Majors

The Freshman course schedule is the same for all three Physics Major concentrations. For students transferring in Calculus 1, please consult with the Physics Department for enrollment advise.

If you have questions or are having issues with enrolling and need an override, please contact either Dr. Kristin Kraemer (Kristin.kraemer@kwu.edu) or Dr. Mike Bell (mike.bell@kwu.edu).

For students with Math ACT at or above 26 or an ALEKs score at or above 76 or have completed Math 121 Precalculus

Fall 2022- Freshman year			Spring 2023- Freshman year		
Prefix and Number	Course Title	Credit Hours	Prefix and Number	Course Title	Credit Hours
Math 145	Calculus I	4	Math 245	Calculus 2	4
Phys 221	General Physics 1	5	Phys 222	General Physics 2	5
Engl 118 or Engl 120	College Writing or Introductory English Composition	4 or 3	Phys 250	Physics Seminar	1
Intd 105	Wesleyan Experience	2	Engl 121	Intermediate English Composition	3
Comp 235	Python Programming	3	Comp 335	Advanced Python Programming or Liberal Studies course of choice	3
	Total	17-18		Total	16

For Students with a Math ACT at or below 25 or an ALEKs score below 75

Fall 2022- Freshman year			Spring 2023- Freshman year		
Prefix and Number	Course Title	Credit Hours	Prefix and Number	Course Title	Credit Hours
Math 120	College Algebra	3	Math 121	Precalculus	3
Phys 121	Physics of Fun	3	Phys 250	Physics Seminar	1
Engl 118 or Engl 120	College Writing or Introductory English Composition	4 or 3	Engl 121	Intermediate English Composition	3
Intd 105	Wesleyan Experience	2	Comp 335	Advanced Python Programming or Liberal Studies course of choice	3
Intd 115	Wesleyan Heritage	1		Liberal Studies course of choice	3
Comp 235	Python Programming	3		Liberal Studies course of choice	3
	Total	15-16		Total	16

Physics Major Requirements- Traditional Physics Concentration

Requirements for Major						
Course Prefix	Course Number	Major Requirements (<i>Pre-Requisite</i>)	Liberal Studies	Req. Hours	Semester Taught	Earned Hours
Math	145	Calculus 1	X	4	Fall	
Math	245	Calculus 2		4	Spring	
Math	246	Calculus 3		4	Fall	
Math	310	Differential Equations		3	Even Spring	
Chem	123	General Chem 1		4	Fall	
Chem	124	General Chem 2		4	Spring	
Phys	221	General Physics 1		5	Fall	
Phys	222	General Physics 2		5	Spring	
Phys	227	Modern Physics		3	Fall	
Phys	340	Advanced Lab 1		2	Fall	
Phys	440	Advanced Lab 2		2	Fall	
Phys	321	Classical Mechanics		3	Even Spring	
Phys	325	Thermodynamics		3	Even Fall	
Phys	260	Circuit Analysis and Electronics Laboratory		3	Odd Spring	
Phys	335	Electromagnetic Theory		3	Even Spring	
Phys	425	Intro to Quantum Mechanics		3	Odd Spring	
Phys	250	Physics Seminar (3 courses at 1 credit hour each)		3	Spring	
Phys	486	Physics Capstone I		1	Fall	
Phys	496	Physics Capstone II		3	Spring	
Phys	165	Data Science		3	Odd Fall	
Phys	265	Scientific Programing		3	Even Spring	
		Subtotal			68	

		Students must pick 2 of the following electives				
Phys	323	Optics		3	Odd Fall	
Phys	485	Special Topics (Repeatable with different sub topics)		3	On Demand	
		Physics electives at 300-400 level		3-6		
		Subtotal		6		
Total Major Hours:				74		

DEGREE REQUIREMENTS					
BACHELOR OF ARTS:					
			Total Hours in Major:	74	
			Liberal Studies:	33	
			Suggested Courses:	0	
			ELECTIVES:	13	
			TOTAL GRADUATION HOURS:	120	

SUGGESTED SEQUENCE
Major: Traditional Physics Concentration
Starting Fall 2022

FALL OF YEAR ONE -Even			SPRING OF YEAR ONE -Odd		
Prefix and Number	Course Title	Credit Hours			
Math 145	Calculus I	4	Math 245	Calculus 2	4
Phys 221	General Physics 1	5	Phys 222	General Physics 2	5
			Phys 250	Physics Seminar	1
	Electives/Liberal Studies	6		Electives/Liberal Studies	5
	Total	15		Total	15

FALL OF YEAR TWO - Odd			SPRING OF YEAR TWO -Even		
Prefix and Number	Course Title	Credit Hours			
Phys 227	Modern Physics	3	Math 310	Differential Equations	3
Phys 340	Advanced Lab I	2	Phys 321	Classical Mechanics	3
Math 246	Calculus III	4	Phys 250	Physics Seminar	1
Phys 165	Data Science	3	Phys 265	Scientific Programming	3
	Electives/Liberal Studies	3		Electives/Liberal Studies	5
	Total	15		Total	15

SUGGESTED SEQUENCE
Major: Traditional Physics Concentration
Starting Fall 2022

FALL OF YEAR THREE Even			SPRING OF YEAR THREE –Odd		
Phys 325	Thermodynamics	3	Phys 425	Quantum Mechanics	3
Phys 440	Advanced Lab II	2	Phys 250	Physics Seminar	1
Chem 123	General Chemistry I	4	Phys 260	Circuits	3
	Electives/Liberal Studies	6	Chem 124	General Chemistry II	4
				Electives/Liberal Studies	4
		Total			Total
		15			15

FALL OF YEAR FOUR – Odd			SPRING OF YEAR FOUR – Even		
Phys 323	Optics*	3	Phys 335	Electromagnetic Theory	3
Phys 486	Physics Capstone I	1	Phys 496	Physics Capstone II	3
	Electives/Liberal Studies	9-15			
				Electives/Liberal Studies	9
		Total			Total
		15			15

Total Hours = 120

* Select 6 credit hours from the following courses: Phys 323 Optics, Phys 485 Special Topics, or other 300 or 400 level Physics Elective

Physics Major Requirements – Applied Physics Concentration

Requirements for Major						
Course Prefix	Course Number	Major Requirements (<i>Pre-Requisite</i>)	Liberal Studies	Req. Hours	Semester Taught	Earned Hours
Math	145	Calculus 1	X	4	Fall	
Math	245	Calculus 2		4	Spring	
Math	246	Calculus 3		4	Fall	
Math	310	Differential Equations		3	Even Spring	
Chem	123	General Chem 1		4	Fall	
Chem	124	General Chem 2		4	Spring	
Phys	221	General Physics 1		5	Fall	
Phys	222	General Physics 2		5	Spring	
Phys	227	Modern Physics		3	Fall	
Phys	340	Advanced Lab 1		2	Fall	
Phys	440	Advanced Lab 2		2	Fall	
Phys	321	Classical Mechanics		3	Even Spring	
Phys	260	Circuit Analysis and Electronics Laboratory		3	Odd Spring	
Phys	250	Physics Seminar (3 courses at 1 credit hour each)		3	Spring	
Phys	486	Physics Capstone I		1	Fall	
Phys	496	Physics Capstone II		3	Spring	
Phys	165	Data Science		3	Odd Fall	
Phys	265	Scientific Programming		3	Even Spring	
		Subtotal		59		

		Students must pick 6 credit hours of the following Physics electives			
Phys	323	Optics		3	Odd Fall
Phys	325	Thermodynamics		3	Even Fall
Phys	335	Electromagnetic Theory		3	Even Spring
Phys	425	Intro to Quantum Mechanics		3	Odd Spring
Phys	485	Special Topics (Repeatable with different subtopics)		3	On Demand
		Physics electives at 300-400 level		3-6	
		Subtotal		6	
		Students must take 15 hours of elective courses from a single related STEM Department (courses may not already be required in the Physics Core). At least 3 courses must be at the 300/400 level. See physics advisor for lists of suggest courses.		15	
Total Major Hours:				80	

DEGREE REQUIREMENTS			
BACHELOR OF Science:			
Total Hours in Major:	80		
Liberal Studies/Core:	33		
Suggested Courses:	0		
ELECTIVES:	7		
TOTAL GRADUATION HOURS:	120		

SUGGESTED SEQUENCE
Major: Applied Physics Concentration
Starting Fall 2022

FALL OF YEAR ONE -Even			SPRING OF YEAR ONE -Odd		
Prefix and Number	Course Title	Credit Hours			
Math 145	Calculus I	4	Math 245	Calculus 2	4
Phys 221	General Physics 1	5	Phys 222	General Physics 2	5
			Phys 250	Physics Seminar	1
				STEM Elective **	3
	Electives/Liberal Studies	6		Electives/Liberal Studies	2
	Total	15		Total	15

FALL OF YEAR TWO - Odd			SPRING OF YEAR TWO -Even		
Prefix and Number	Course Title	Credit Hours			
Phys 227	Modern Physics	3	Math 310	Differential Equations	3
Phys 340	Advanced Lab I	2	Phys 321	Classical Mechanics	3
Math 246	Calculus III	4	Phys 250	Physics Seminar	1
Chem 123	General Chemistry I	4	Phys 265	Scientific Programming	3
Phys 165	Data Science	3	Chem 124	General Chemistry II	4
				Electives/Liberal Studies	1
	Total	16		Total	15

SUGGESTED SEQUENCE
Major: Applied Physics Concentration
Starting Fall 2022

FALL OF YEAR THREE Even			SPRING OF YEAR THREE –Odd		
Phys 325	Thermodynamics*	3	Phys 425	Quantum Mechanics*	3
Phys 440	Advanced Lab II	2	Phys 250	Physics Seminar	1
	STEM Elective **	3	Phys 260	Electronics	3
	Electives/Liberal Studies	6-9		STEM Elective **	3
				Electives/Liberal Studies	5-8
		Total			Total
		14			15

FALL OF YEAR FOUR – Odd			SPRING OF YEAR FOUR – Even		
Phys 323	Optics*	3	Phys 335	Electromagnetic Theory*	3
Phys 486	Physics Capstone I	1	Phys 496	Physics Capstone II	3
	STEM Elective **	3		STEM Elective **	3
	Electives/Liberal Studies	8-11			
				Electives/Liberal Studies	6-9
		Total			Total
		15			15

Total Hours = 120

* Select 6 credit hours of course from the marked courses, Phys 485 Special Topics, or other physics electives at the 300/400 level.

** Select 15 credit hours from another STEM Field, with at least 3 courses at the 300/400 level.

Physics Major- Engineering Physics Concentration

Requirements for Major						
Course Prefix	Course Number	Major Requirements (<i>Pre-Requisite</i>)	Liberal Studies	Req. Hours	Semester Taught	Earned Hours
Math	145	Calculus 1	X	4	Fall	
Math	245	Calculus 2		4	Spring	
Math	246	Calculus 3		4	Fall	
Math	310	Differential Equations		3	Even Spring	
Chem	123	General Chem 1		4	Fall	
Chem	124	General Chem 2		4	Spring	
Phys	221	General Physics 1		5	Fall	
Phys	222	General Physics 2		5	Spring	
Phys	227	Modern Physics		3	Fall	
Phys	340	Advanced Lab 1		2	Fall	
Phys	440	Advanced Lab 2		2	Fall	
Phys	321	Classical Mechanics		3	Even Spring	
Phys	323	Optics		3	Odd Fall	
Phys	250	Physics Seminar (3 courses at 1 credit hour each)		3	Spring	
Phys	486	Physics Capstone I		1	Fall	
Phys	496	Physics Capstone II		3	Spring	
Phys	165	Data Science		3	Odd Fall	
Phys	265	Scientific Programming		3	Even Spring	
Comp	160	3D Design, Digitizing, and Printing		3	Every Semester	
		Subtotal		62		
		Students must pick 6 credit hours of the following Physics electives				

Phys	260	Circuit Analysis and Electronics Laboratory		3	Odd Spring
Phys	325	Thermodynamics		3	Even Fall
Phys	335	Electromagnetic Theory		3	Even Spring
Phys	425	Intro to Quantum Mechanics		3	Odd Spring
Phys	485	Special Topics (Repeatable with different sub topics)		3	On Demand
		Physics electives at 300-400 level		3-6	
		Subtotal		6	
		Students must take 15 hours of engineering courses from an accredited Engineering Program. At least 9 hours must be at the 300/400 level.		15	
Total Major Hours:				83	

DEGREE REQUIREMENTS			
BACHELOR OF ARTS:			
Total Hours in Major:	83		
Liberal Studies:	33		
Suggested Courses:	0		
ELECTIVES:	4		
TOTAL GRADUATION HOURS:	120		

SUGGESTED SEQUENCE
Major: Engineering Physics Concentration
Starting Fall 2022

FALL OF YEAR ONE -Even			SPRING OF YEAR ONE -Odd		
Prefix and Number	Course Title	Credit Hours			
Math 145	Calculus I	4	Math 245	Calculus 2	4
Phys 221	General Physics 1	5	Phys 222	General Physics 2	5
			Phys 250	Physics Seminar	1
	Electives/Liberal Studies	6	Comp 160	3D Design & Printing	3
				Electives/Liberal Studies	3
	Total	15		Total	16

FALL OF YEAR TWO - Odd			SPRING OF YEAR TWO -Even		
Prefix and Number	Course Title	Credit Hours			
Phys 227	Modern Physics	3	Math 310	Differential Equations	3
Phys 340	Advanced Lab I	2	Phys 321	Classical Mechanics	3
Math 246	Calculus III	4	Phys 250	Physics Seminar	1
Phys 165	Data Science	3	Phys 265	Scientific Programming	3
Phys 323	Optics	3	Phys 335	Electromagnetic Theory*	3
	Electives/Liberal Studies	3		Electives/Liberal Studies	6-9
	Total	18		Total	18

SUGGESTED SEQUENCE
Major: Engineering Physics Concentration
Starting Fall 2022

FALL OF YEAR THREE Even			SPRING OF YEAR THREE –Odd		
Phys 325	Thermodynamics*	3	Phys 425	Quantum Mechanics*	3
Phys 440	Advanced Lab II	2	Phys 250	Physics Seminar	1
Chem 123	General Chemistry I	4	Phys 260	Circuits*	3
	Physics Capstone I	1	Phys 496	Physics Capstone II	3
	Electives/Liberal Studies	6-9	Chem 124	General Chemistry II	4
				Electives/Liberal Studies	3-9
		Total			Total
		15			17

FALL OF YEAR FOUR – Odd			SPRING OF YEAR FOUR – Even		
	Courses from Dual Degree			Courses from Dual Degree	
	Engineering Partner University			Engineering Partner University	
		Total			Total
		15			15

Total Hours = 120+

* Select 6 credit hours of course from the marked courses, Phys 485 Special Topics, or other physics electives at the 300/400 level.

Note: This 4-year plan assumes all liberal studies, core, and major courses with the exception of the engineering courses are completed in 3 years of fall and spring semesters. Course load each semester may be reduced by completing the 4-2 instead of 3-2 Dual Degree Engineering Programs, taking summer courses, or by transferring in credits from a Dual Degree Engineering Program to fulfill the above requirements. See your advisor for help planning alternative schedule.