

**Physics Course Options for Freshmen**  
**A Guide for the Perplexed**  
**Department of Physics, Bryn Mawr College**  
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*Ah, the ignorance of humankind!*

Here we are, it's 2011 CE and we don't know what causes mass. We might have a better idea when the Large Hadron Collider in Geneva, Switzerland comes on line. Maybe there are more than three spatial dimensions. Maybe not. We don't know. Quantum uncertainty says the universe is a fuzzy place, general relativity curves spacetime but says the universe is a smooth place. They are completely contradictory. Dark Energy is making the expansion of the universe speed up and we have no clue what it is. And, is our universe the only one? Or are we just one universe in a multiverse? What a great time to do physics!

**"The creation of Physics is the shared heritage of all mankind."  
— Abdus Salam, 1926-1996, Pakistani physicist, Nobel Prize in Physics 1979**

At Bryn Mawr College you should take the opportunity to diversify in parallel with choosing a major and deciding on courses consistent with your "life after Bryn Mawr." Be brave. Be bold. Instead of taking a course in something you have "placed out of," take Anthropology, or Geology, or Archaeology, or Africana Studies, or Growth and Structure of Cities, or . . . . Physics. Just do it!

Your dean will help you understand the various physics courses available. The physics undergraduate courses adviser is Mark Matlin and he is available to answer questions ([mmatlin@brynmawr.edu](mailto:mmatlin@brynmawr.edu)). He will be at the Academic Fair held before classes.

All physics courses are described in greater detail in the catalog. See <http://www.brynmawr.edu/catalog/physics.php>. The main difference between physics courses in a place like Bryn Mawr and your high school is that at Bryn Mawr they are taught by practicing physicists. Members of the department do research. Some have

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National Science Foundation research grants, all publish in international refereed journals, and all bring the process of doing physics to the classroom. Feel free to ask for a tour of the research labs.

***I am a humanities person. I hate mathematics. I will never take it.  
You can't make me. I won't do it!***

The Physics Department will offer two half-semester conceptual physics courses this fall semester. In the first quarter will be P131, "How Things Work," which looks at how various familiar devices and appliances operate and the physics behind them. In the second quarter, P132, "The Universe According to Einstein" will be offered. It will explore the special theory of relativity in depth, provide a brief overview of the general theory of relativity, and look at some implications of these theories. These courses do not satisfy the pre-health professions requirement or the quantitative skills requirement (because they have minimal math prerequisites). They do offer an optional laboratory component, which satisfies the lab requirement.

**"In physics, you don't have to go around making trouble for yourself.  
Nature does it for you."  
— Frank Wilczek, Physics Nobel Prize 2004**

***I want to see how mathematics is used in the development of  
physical models.***

The first semester course, P121, is a mixture of conceptual physics, mathematical modeling, and problem solving. The course involves several topics in 20th and 21st century physics. Math 101 (M101) is a co-requisite and calculus will be used extensively. P122 follows second semester. It is classical mechanics with M102 as a co-requisite. But the first-semester 121 is a stand-alone, self-contained course on "modern" physics. You don't have to take the second semester if you and your advisers decide that is not the best option for you. The physics department feels that the mathematical challenge and the small class sizes in P121 (and P122) will appeal to many Bryn Mawr College freshmen who want to bravely go where no woman has gone before. Note that you cannot use AP or IB Physics to place out of out of P121 and P122.