

Proposal for a Modification of Physics Minor

Context: The physics department currently offers a physics minor and an astrophysics minor. The physics minor currently has very few (if any) active students. The current physics minor is highly inflexible, requiring 5 specific courses. There is also a hidden prerequisite of PHYS-223 or PHYS-224, which also must be taken in order to access both PHYS-405 and PHYS-304. It is desirable to make this minor program more flexible to make it accessible to a wider variety of students.

Minors at Illinois Tech: The current language around minors at Illinois Tech is here:

<https://catalog.iit.edu/undergraduate/undergraduate-education/minors/>

In particular: "A minor consists of at least five courses (minimum of 15 credit hours), of which at least four courses (minimum 12 credit hours) are not required for a degree program."

Current Physics Minor:

- PHYS-301 (Mathematical Methods of Physics) 3 Credit Hours
- PHYS-304 (Thermal and Statistical Physics) 3 Credit Hours
- PHYS-308 (Classical Mechanics) 3 Credit Hours
- PHYS-405 (Fundamentals of Quantum Theory I) 3 Credit Hours
- PHYS-413 (Electricity and Magnetism I) 3 Credit Hours

New Proposed Minor in Physics: The minor is intended for a target audience of students with majors outside of physics or astrophysics. It is suggested that we make the minor inaccessible to students majoring in physics or astrophysics as [some other departments have done](#).

- One of the following:
 - PHYS-223 (General Physics III) 4 Credit Hours
 - PHYS-224 (General Physics III for Engineers) 3 Credit Hours
- At least two of the following:
 - PHYS-304 (Thermodynamics/Statistical Physics) 3 Credit Hours
 - PHYS-308 (Classical Mechanics I) 3 Credit Hours
 - PHYS-405 (Fundamentals of Quantum Theory I) 3 Credit Hours
 - PHYS-413 (Electricity and Magnetism I) 3 Credit Hours
- At least 6 credit hours of physics electives (any PHYS courses at 300 level or above).

Feasibility of the Minor for Engineering Students

We examined program requirements for a few representative engineering programs to see whether the minor would be feasible for such students:

Minor can be accommodated without overloads or transfer credits:

- [B.S. in Electrical Engineering](#): 130-133 credit hours with 12 credits of career electives and 3 credits of free electives. Students could complete their major and this minor in 4 years.
- [B.S. in Mechanical Engineering](#): 127 credit hours with 12 credit hours for free electives and 6 credit hours for technical electives. Students could complete their major and this minor in 4 years.

Minor requires 6-9 credits of overloads, transfer credits, or summer courses:

- [B.S. in Aerospace Engineering](#) 127 Credit Hours with 6 credit hours for free electives and 3 credit hours for technical electives. Students would need 6 credit hours of overload, summer courses, or transfer credits to successfully complete their major and minor in 4 years.
- [B.S. in Computer Engineering](#): 131 – 135 credit hours with 9 credit hours for “career electives”. Students would need 6 credit hours of overload, summer courses, or transfer credits to successfully complete their major and minor in 4 years.
- [B.S. in Chemical Engineering](#): 132 – 133 credit hours with 9 credits of technical electives (but 3 must be used for a CHE course). Students would need 9 credit hours of overload, summer courses, or transfer credits to successfully complete their major and minor in 4 years.

Minor requires significant (9+ credit hours) of overloads/transfer/summer credits:

- [B.S. in Civil Engineering](#): 130 credit hours with 9 credit hours of technical electives, but these are restricted to engineering courses.
- B.S. in biomedical engineering programs: Little room to accommodate technical electives or free electives outside of engineering.