

## Certification

Once you have passed the written certification test, you will be assigned one of these tasks. Your success at this task is the final step in obtaining your certification for the ISC 226 printer. Once certified, you may print without further supervision or permission, as long as you follow the rules in the training guide. If you are discovered breaking the rules, you will lose your certification.

If you lose your certification, and you are caught printing, then the printer will be removed from ISC226 for the remainder of the semester, and your classmates will be told that it was taken away because of *you*.

Your project should require less than 16g (about 2 meters of filament) and less than 3 hours to print. You may not consult any online source that provides 3D designs at any stage of your design process. Even if you pick one of the projects below, Dr. Pogo must approve it first.

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Design and print:

1. A DC motor support. You may choose any Lego or DC motor found in ISC 226. The motor shaft will be horizontal. The support should balance on its own, but also have properly designed holes allowing it to attach to other components. There must be a way to access the motor wires!
2. A stepping motor support. You may choose any small stepping motor found in ISC 226. The motor shaft will be horizontal. The support should balance on its own, but also have properly designed holes allowing it to attach to other components. There must be a way to access the motor wires!
3. An attachment to a screwdriver that converts it into a  $\frac{7}{16}$  inch socket driver.
4. A shaft attachment for an AC (Bodine) electric motor. The attachment should allow the user to easily attach other objects so that they rotate on the shaft axis. The attachment should not fall off of the motor!
5. In Analyt I Lab, you did an experiment with a sparking wire attached to a cart on an air track. Design an adapter to properly affix the wire to the cart. The best designs will make it very hard for the students to incorrectly attach a wire.
6. Make a holder for a set of batteries. There must be two wires coming out from the holder in such a way that it would be hard for me to accidentally yank them out. The proper orientation of the batteries must be clear to the user, and hard to mess up. There are several options:
  - a. Hold 3 AA batteries; measurement should be 4.5 V.
  - b. Hold 3 AAA batteries; measurement should be 4.5 V.
  - c. Hold 2 9V batteries; measurement should be 18.0 V.
7. Make a hand-held crayon sharpener.
8. Make a bracket to hold a laser pointer perpendicularly on one of the metal support sticks that we use in the Analyt Labs. It should not need tape to help hold it in place. There should be an easy way to reposition the laser pointer so that your bracket can either keep the button “on” or “off”, as desired.
9. In various labs, we use vertical  $\frac{3}{4}$  inch OD steel posts to hold stuff up. We’d like to be able to attach a small horizontal table to hold other light weight equipment without sliding down. You can make the table itself of plywood, assuming you specify dimensions that only require minimal woodshop work. So, how is the table attached to the post?