

Safety Information Handout

JMU 3-SPACE Classroom

To use this room you must complete a Risk Certificate form and pass a Safety Protocol Quiz whose questions are based on this handout.

This classroom is equipped with gloves and safety glasses at each station, a first aid kit, and an extra ventilation fan for the room. Please use this equipment, common sense, and caution as necessary for your protection and to mitigate the hazards listed below.

Some things are hot:

- The Afinia extruder nozzle reaches 260° C (500° F) and should never be handled without gloves when hot.
- The top of the Afinia build plate reaches 110° C (230° F) and should not be touched for extended periods of time when hot.
- The bottom of the Afinia build plate, the area under the plate (including the leveling screws), and other areas of the housing can exceed 110° C (230° F) and should be handled only with gloves when hot. Please be aware that you should avoid touching these areas when the machine is in operation.
- The Afinia extruder and other interior parts inside the white cover can exceed 260° C (500° F) and should never be handled without gloves when hot.
- The Nicole heat tool must be used with gloves and tweezers to keep hands away from the output of the tool.
- Objects recently heated by the Afinia 3D printer or Nicole heat tool (including models, scrap plastic, tweezers, and other tools) can remain hot for some time. Please use gloves and due caution with all hot objects until they have cooled.
- The tea kettle boils water. Which is hot. Please use appropriate caution when making tea.

Some things are sharp:

- The sharp spatula should be used with extreme caution and only when a glove is used on the supporting hand. When using the sharp spatula to scrape a model from the build platform the model often releases suddenly, causing the sharp spatula to move very quickly toward the supporting hand. It is very sharp and can give very deep cuts in this situation. This is potentially the most hazardous object in the classroom and should be used with caution and a protective glove every time.
- The carving tool should be used with the curved edge pointed towards your thumb, and applied with a controlled motion that you know will not cause the edge to reach your thumb unexpectedly. This tool can also break if used incorrectly. Please use with caution and only after being properly trained.
- The orange pliers and thin tweezers are also sharp and an appropriate amount of caution should be used when working with these tools.

Some things are flight hazards:

- When removing support material or scraping a model from the build platform, pieces of plastic may become dislodged and fly through the air. Please wear safety glasses when performing these operations, particularly if you do not already wear glasses.
- Flying bits of plastic and dislodged models are also a danger to your neighbors; please make sure that nearby people are aware of your actions and that they are not in the path of such objects.
- Food and drink should be kept away from support-cleaning operations so as not to become contaminated with loose bits of plastic or filament.

Some things are moving hazards:

- The Afinia motors and moving parts have no safety monitoring to stop in the case of a finger or hand that is in their path. Please keep hands, hair, jewelry, and clothes away from moving parts at all times. In the course of a print job, the extruder head may move erratically in ways that you do not anticipate.
- If the Afinia build plate is raised when the machine is turned off, then the plate and housing will release and crash to the base; this has the potential to injure both the machine and your hand. Please always press the initialization button on the front of the machine before turning off. You may have to press and hold the button for a couple of seconds. Then wait until the build plate reaches the base and moves to the back, at which point the machine will beep. It is then safe to shut off the machine.

Some things give off odors:

- The Afinia 3D printers use ABS plastic, which when heated can sometimes give off an odor or emissions. If you are sensitive to this odor then try to avoid sitting very close to the machine when in operation.
- The ventilation in this room has been approved for running all printers simultaneously, but when many printers are running at a time, then we recommend propping open the door and possibly also using the white fan for additional circulation.
- If a small amount plastic becomes adhered to the extruder nozzle or becomes overheated or burned then additional odors can occur, and use of the door or fan is recommended.
- If you are particularly sensitive, then you are always free to remove yourself to the hallway or the room behind 3-SPACE in the event that you are bothered by an odor.

Some things are breakable:

- The Afinia perf board is held down with four small binder clips. These clips must be applied to the front and back of the perf board, never to the sides. Clips on the sides can cause damage to the unit when the perf board moves front to back during initialization and printing.
- The tip of the carving tool should not be used to extract support material except in the curved carving manner for which it was intended. Forceful use of the tip of this tool can

cause it to break off. Please note that this event would also pose a flight hazard; see the section above.

- The thin tweezers are very fragile and the tips will bend or break if used forcefully. Please only use this tool gently and not for difficult support material removal.
- Although beverages and small amounts of food are permitted in this classroom, please be sure to keep all food and drink away from the equipment. In the event of a spill or other incident please notify the instructor so that any affected equipment can be cleaned quickly.

Some things need to be turned off or unplugged:

- The Afinia 3D printers should be turned off when no longer in use. The on/off switch is on the back right corner of the machines. Please be sure that the initialization button has been pressed and the build plate is lowered before turning off (see the “moving hazards” section above). The machines should remain plugged in.
- The Nicole heat tool should be unplugged immediately when no longer in use.
- The computers should remain on and plugged in at all times. They are set to “sleep” if left unattended.

Some things need to be cleaned up every day:

- When no longer in use, all tools should be cleaned up and put away in the green baskets in their appropriate locations.
- Scrap plastic such as support material and raft material should be disposed of in the clear plastic “scrap” bin on the side counter. Failed models should be deposited in the “fail” bin.
- All computer programs should be closed and items removed from the desktop when no longer in use. The Google Drive should be used for all classroom file storage.
- If you make a mess, please clean it up. If you use a cup, please wash it out in the bathroom or nearby fountain. Please help us keep this space clean for all classes and visitors.

What if something happens?

- Every cut, burn, or other incident must be reported with an Incident Report Form that will be filed with the JMU Risk Management office. Please use this reporting form and also inform your instructor of any incident that happens in the classroom, even if very small.
- There is a First Aid kit for your use on the side table near the tea kettle area and document holder. Please feel free to use whatever you need from this kit. This kit provides care for minor cuts and burns.
- For more major injuries or emergencies please call JMU Campus Emergency Police at 568-6911, or call 911. The tools in the First Aid kit can help you until emergency services arrive. You can also call Laura Taalman anytime at 540-246-3185 for further support.
- We recommend always coming to 3-SPACE with another person outside of class hours, so that if an emergency arises there will be another person to help manage the situation. Please be safe and make good choices when using 3-SPACE outside of class hours.