

NOTE: The information contained in this report is for planning and discussion purposes only. There is no guarantee that items listed will be funded and designed as stated or to full capacity.

Initial Report on Needs for Natural Sciences in New Building

The current Science building at NLC houses four lecture rooms, three Biology labs, two Chemistry labs, one Geology lab (which doubles as lecture space), and one Physics lab (currently used for lecture space). Science courses are also taught in the Wellness building lecture rooms during peak hours.

NLC had over 1700 enrollments in Science department classes in the Spring of 2016, with over 900 enrollments in courses housed in lab rooms. If we can expect to eventually double our student head count over the next several years, we should at least attempt to increase our capacity to match.

Lab rooms designated for each course type would improve efficiency in scheduling and lab preparation. With the assumption that all of the natural sciences will be moving to the new building, we propose the following to accommodate potential growth:

12 new lecture rooms

14 new lab rooms, as follows:

1. Intro Chemistry
2. Intro/General Chemistry hybrid lab (CHEM 1407 and CHEM 1412)
3. General Chemistry
4. Organic Chemistry
5. Chemistry Research Lab (student grants, etc.) – may also be used for growth
6. Geology Lab
7. Anatomy and Physiology I Lab
8. Anatomy and Physiology II Lab
9. General Biology (majors and non-majors)
10. General Biology II/Genetics/Environmental Science Lab
11. Microbiology (majors and non-majors)
12. Biology Research Lab (student grants, etc.) – may also be used for growth
13. Physics Lab (all courses, for now)
14. Study/tutoring Lab (for all lab courses – much like our current study center)

Lab Prep areas (for each discipline) attached to multiple lab rooms, with offices for the lab technicians adjacent to the work area. If lab rooms are clustered, one prep room could handle 4-5 labs.

Room(s) for special operations (deionized water, gas, air, vacuum, telecom)

Storage space for chemicals, lab equipment, and biological specimens

Office space for 16 faculty, with an adjunct office space and a secure reception/office area for Academic Unit Assistants

[All photos are of Alamo Colleges facilities unless otherwise noted. These photos are to guide discussion.]

Chemistry lab needs:

50 sq. ft. per student at an absolute minimum (1200 sq. ft. for 24 students) per NFPA regulations. Labs should be at 1300+ sq. ft. for safety and to ensure ADA compliance (clearance between benches).

Safety shower and eye wash area should have a drain in the floor. Other safety equipment should include a first aid kit, fire blanket, fire extinguisher, gas and electric cutoffs, and spill control materials. These should all be in one area away from windows and doors if possible.



ADA compliant seating in both lecture and lab areas.

No rolling chairs or rolling stools.

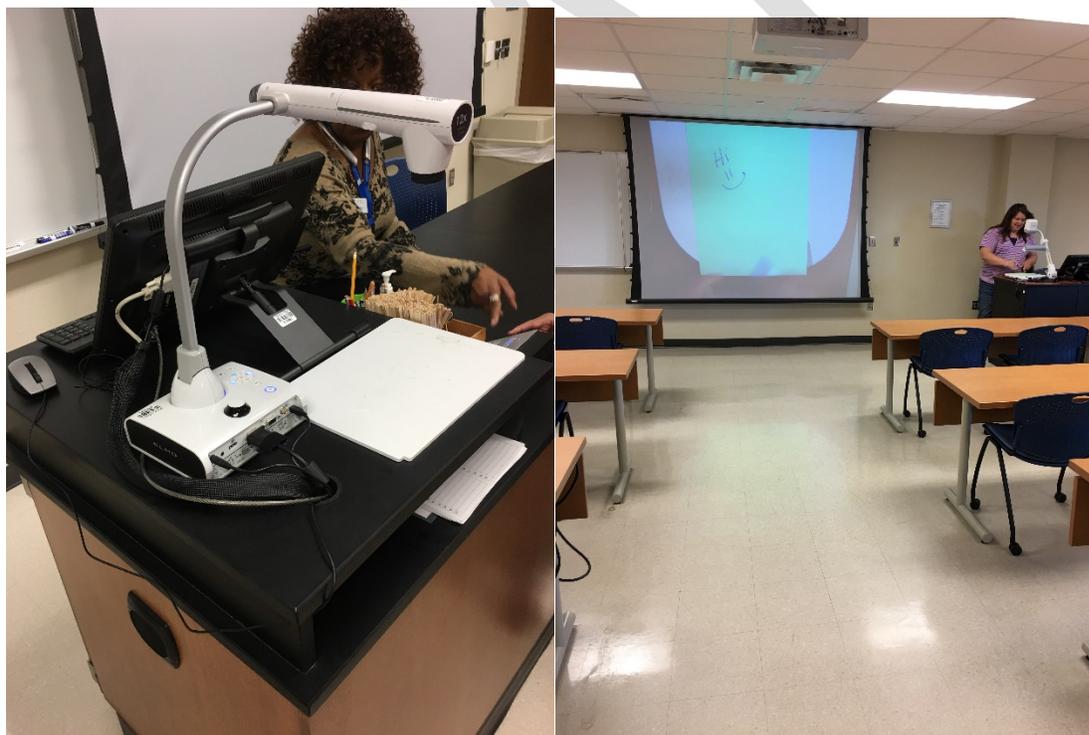
Ventilation fan for negative pressure (keeps air coming into the labs from the halls, and also exchanges lab air on a regular basis). These should have an on/off switch.

Enough fume hoods in each lab to prevent crowding (varies by lab). Fume hoods should be 72" wide by 30" deep, and have a cup sink. Organic chemistry will need more fume hoods than other labs.

Instructor's benches should have a sink with water, electricity, and gas.

Labs should also have a projector with a screen (or a smart podium) tied into the instructor's computer. This should be built in to the instructor's bench (no carts). Cords should be secured to avoid tripping hazards

ELMOs and Smart workstations with a Smart podium (not the same as smart boards or mimeo boards!) should be considered for instructor workstations. See below.



Labs should have tile floors, and lab benchtops should be standard resin (chemical resistant).

Sinks in labs on the wall benches should have drain racks above.

At least one sink should be available at each student workbench. All sinks should have ergonomic comfort mats in front.

Sinks should have vacuum breakers installed.

Classroom/lab door windows, if they are necessary, should be smaller safety mesh windows.

Consider reducing or eliminating classroom/lab windows.

Electrical outlets in labs should all be of the GFI (ground fault interruption) type. These electrical outlets should be available at each lab bench and in common bench areas along the sides of the room.

Hard-wired computer lines and/or wi-fi access.

Counter height lab benches (what we have now) instead of standard height, with all seating facing toward the front – this helps the students see the screen/whiteboard and helps the instructor observe student work at the lab benches. Below are possible examples of how this might look for intro/general chemistry:



Lockable drawer or cabinet space for goggles, aprons, lab coats, and lab equipment should also be included, and accessible by students on the same side of the lab bench if possible. Chemistry faculty/staff would institute a lab drawer checkout/in system. Perhaps lab fees could be instituted for these classes, or we could start a “you break, you buy” procedure as other colleges have done.

Dropdown screen should be offset from center to allow more usable whiteboard space when screen is in use.

Instructors desk should have workstation offset from center so it will not block student view.

Labs should be outfitted with deionized water capability, or at least the prep rooms should. A central DI water room with lines out to the labs is preferred.

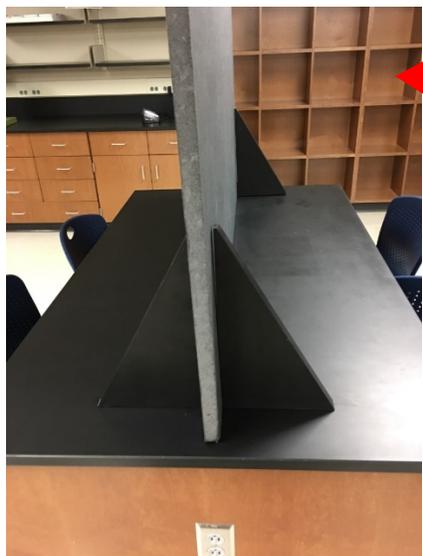


Post holes for ring stands in all benches, with the underside accessible by instructors to tighten them as needed.

Shelving and storage everywhere we can get it.

Computer setup for chemistry lab probes – new COWs designated for the individual labs.

Cubby holes should be provided for student materials (safety issue with books and bags on the floor):



Cubby holes

Biology Lab Needs: Many of the same principles apply here as to the chemistry labs, with these notable differences:

Anatomy lab tables need more flat space, with sinks at the ends of tables (or otherwise away from general workspace).

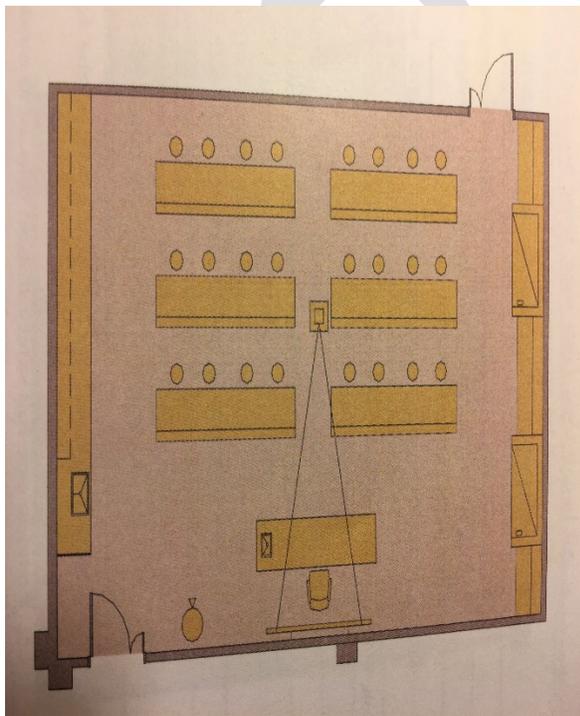
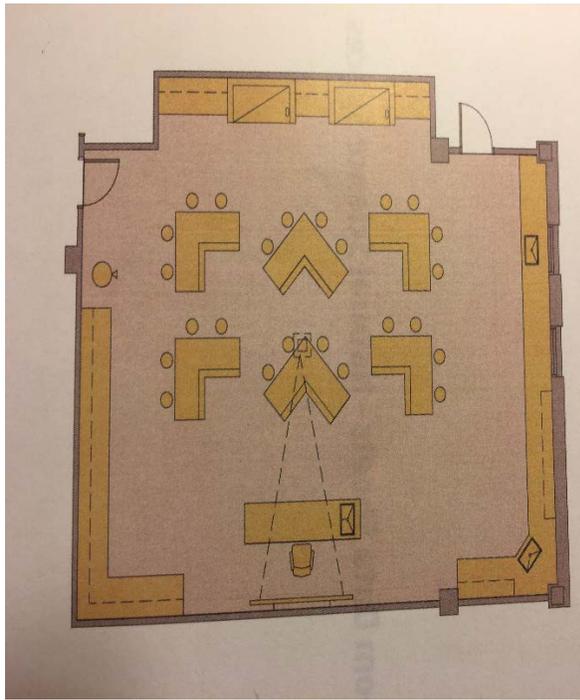
Rolling chairs are possible in general biology and anatomy labs. Please avoid rolling chairs in Microbiology.

Microbiology labs will need several incubators set at various temperatures.

Ample storage space is needed for models and microscopes. We currently have designated shelf space for each individual microscope and model, but we are nearly out of room. The general goal would be to have one of each model type for every four students (six of each model), and 24 microscopes per lab room. To expand capacity we will need more microscopes and more of some models.

For labs, hoods would be best in the back of the room (away from the front board/instructor desk). We should also avoid having cabinets on each side of the instructor's desk since they block the view of the white boards.

Possible ideas for room layouts:





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This is actually the organic lab at SPC – they have two long tables (12 students each) and 12 fume hoods. Make this three long tables (8 students each), use chairs instead of stools, and replace most of the fume hoods with cabinetry and this setup would work well for an Anatomy lab.

Cubby Holes in these labs too, please. In fact, these should be in every lab, and we should at least consider them for classrooms too.



Cubby holes here – this is also another possibility for an anatomy lab setup, if we put small sinks at one end of each table.

Geology Lab Needs: Basic lab principles apply, but for Geology the primary need is for storage of specimens, many of which can be quite heavy.

Specimen storage, primarily in study sets for small student groups. Our current lab room does not have enough storage for our specimens. We need closet-style storage with shelves.

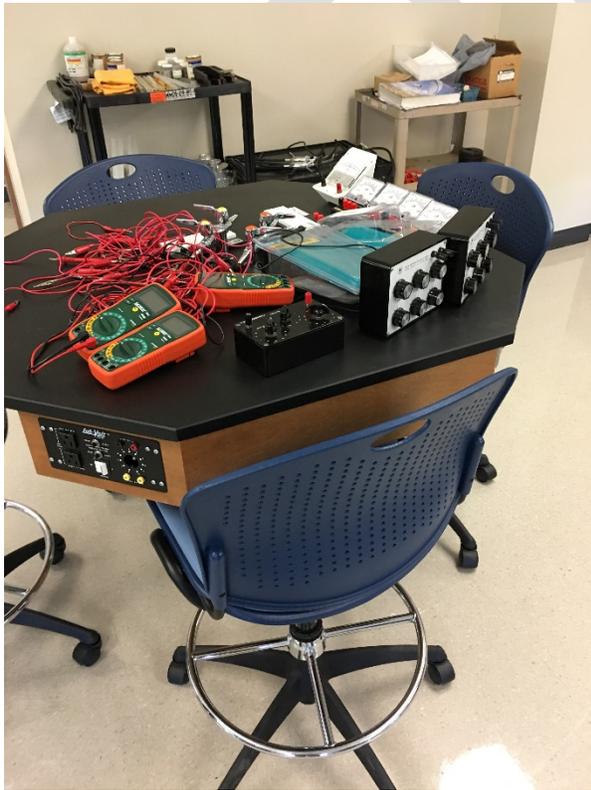
An exhibit space where type specimens of rocks/minerals can be displayed would be helpful for the students.

Some specimens are tested with acids, so a small storage area will be needed.

Our current geology lab is very undersized (around 850 sq. ft.).

Physics Lab Needs: Basic lab principles apply.

Lab tables need to accommodate various lab apparatus, so powered tables are preferred:



Ample storage for sizeable lab equipment (air tracks, circuit boards, etc.) will be needed in the physics lab. We will also need to provide funding for the equipment.

Prep rooms:

These rooms should be large with ample bench space, a fume hood, chemical storage cabinets, and appropriate safety equipment.

Sinks, gas, and GFI electrical outlets available.

Ice machine for both Bio and Chem – this room should be lockable.

On the Biology side we will need at least one working autoclave, larger than the benchtop variety.

Open shelving in the prep room (like a library) to store bins containing each lab prep.

Lab prep areas should be centrally attached to the lab rooms. There should be no need to move equipment through general use hallways.

We should also have ample storage for chemicals and supplies, with appropriate safety cabinetry. This may require more space than the prep areas can provide. Most colleges have separate rooms for chemical storage.

Refrigerators and freezers for biological reagents and microbiological media will be needed. Note that biology freezers must NOT be of the no-frost variety. At some point we may also need a minus-80-degree freezer for special reagents/cultures.

We will need staffing for the labs – one lab tech for bio and one for chem may not get the job done. Perhaps this could be someone who can staff the open lab area and also perform checks/maintenance on the DI water area and gas closet as needed.

Below is an example of what a prep room might look like:



Lecture Classrooms:

Cubby holes.

Lecture rooms should have electrical outlets in/on the tables as opposed to the outer walls of the rooms, to prevent tripping hazards when students plug in their laptops, phones, etc.



All seats facing the front if possible to avoid neck strain.

Ample whiteboard space at the front (and sides) of the classroom. If possible set up the instructor's podium and screen so that the screen only covers one side of the whiteboard at the front of the room (as opposed to dropping the screen right down the middle, which renders the whiteboard space unusable at times).

Instructor's bench should also have a projector with a screen (or a smart podium) tied into the instructor's computer. This should be built in to the instructor's bench (no carts). Cords should be secured to avoid tripping hazards.

ELMOs and Smart workstations with a Smart podium (not the same as smart boards or mimeo boards!) should be considered for instructor workstations.

Office Areas/general building:

Entrance/exit doors to the new building should be situated so that students do not have to pass through **faculty work areas** to enter/exit the building (as currently is the situation in SCIN). As far as I know the current science building is the only one on campus constructed this way (with faculty work areas directly between classrooms and the entry/exit), and it has become a significant security problem.

Lounge areas with vending should be included.



Study tables in halls for better use of space:



A workroom and kitchen area should be placed near the faculty offices but away from student traffic.

If possible, construct reception areas for the AUAs that provides document security but is also open to visitors.

If possible faculty offices should be placed so that each office has a window.

Restrooms should be centrally located (or have restrooms at each end of the building).

Additional storage room for office supplies and materials.

A suite in the new academic bldg for either the academic dean or the academic vp – one that centralizes the various staff and provides for working storage.

A conference room in the new academic bldg for mtgs of Academic Leadership and committees. Academics no longer has a conference room in the current bldg. It doesn't need to be as large as NLIB200 – seating for about 12 should be adequate. With a white board and projector/screen media setup.

Dedicated open student gathering spaces (as on 3rd floor of the current academic bldg), possibly with some tables for some of the space.

A foyer for table space as in the current academic bldg.