

# Milwaukee Area Technical College

Insights into how science environments are evolving to meet today's student and faculty needs.







Founded in 1912, the Milwaukee Area Technical College (MATC) continues to evolve to meet the current needs of the communities in SE Wisconsin. From high school completion programs, to an apprenticeship program for the military, and the challenges of ever-changing to technology-based programs, MATC continues its mission: “Dedicated to student success, responsive to rapidly changing job and market needs, committed to efficiency and strengthened by continuous quality improvement, Milwaukee Area Technical College is transforming lives, industry and community”.

Today’s demand for STEM-based careers, including the expansion of medical technologies, have required many college campuses around the country to undertake renovation and technology upgrades for science education, and MATC is no exception. For over 25 years MATC has partnered with Kahler Slater for campus improvements and recently to begin a second generation of renovations to redesign classrooms and labs from a 1990’s project. The goal of this project is to adapt the classrooms and labs to the changes in the delivery of science education and advancing technologies.





Through their many years of use, these classrooms and labs were adapted to meet the changing needs of learning for both faculty and students. As an example, wiremold was added at the perimeter walls, extending down from the ceiling to feed new computer stations, incubators, specimen cabinets and goggle sterilizers. There was also a shortage of storage which was common within all the rooms. Despite the perceived lack of functionality, a study of the existing spaces identified an approach to efficiently adapt the rooms to meet today's teaching and learning needs. Through a collaborative planning process, a minimal level of customization ensured the new labs would meet the needs of the sciences while also providing for long-term flexibility. The MATC/Kahler Slater team configured the new labs for more collaborative learning, accommodate new equipment and technologies, creating more efficient and safer environments.





# Rethinking Student and Instructor Spaces that Enables Collaborative Hands-On-Learning

A key modification was the design of the lab student benches and associated services to provide for a more collaborative, interactive hands-on learning experience. As an example, at the MATC West Allis campus, the Microbiology student benches were converted from a traditional layout of rows to a series of pentagon shaped stations which include equipment storage, sinks, power, and data connections, accommodating 4-students each. Students are now enabled to work more collaboratively in groups of two and can connect their laptop at the bench and share their work onto an instructor's screen if needed. While the instructor has a fixed demonstration work station, this new room layout, paired with updated technology, allows for the instructor to easily move around the rooms and work with individual groups.

Similarly, in the Anatomy and Physiology (A & P) Lab, the instructor desk was replaced with a fixed demonstration station which includes an adjacent digital workstation. The student work stations were redesigned with deeper tops and the rows were widened to allow students to turn their chairs, enabling them to work with students seated behind them. Gas services were removed at the student workstations, replaced with additional power and data for equipment and computers, allowing for greater functionality to the space.

At the MATC Downtown campus, Anatomy and Physiology labs' long benches were replaced by 4- person "H" shaped workstations, designed to provide individual seating spaces, divided by microscope and instrument storage. The open end of the "H"-shape allows the instructor to more closely engage with the student teams. The bench tops include power and data for computer and equipment use at each workstation. Perimeter casework and tall upper cabinets maximize storage and include digital work areas for virtual reality programs.







# Technology and Equipment Enhance the Learning Experience

As the team reviewed the labs for renovation, one of the largest requests from the College was to be able to effectively support the needs of the science, from wet bench to virtual learning. Functionality required extra power and data for additional computers and new lab equipment. Power and data outlets were added at the perimeter of the room and at student benches to provide the required flexibility, eliminating cords being unsafely draped throughout the room. MATC added wireless technology at each campus, in addition to wired systems, increasing the flexibility for the entire campus.

Through the planning process additional space was identified for the accommodation of new virtual reality technology. As an example, at MATC West Allis, power and data outlets were added at the perimeter counter top spaces allowing for the integration of digital graphic visualization systems, used for teaching. An Anatomage Table, (a virtual human anatomy table) was able to be integrated into the room, as an outcome of the reconfiguration of the student workstations. Further, at the MATC Downtown campus, a new room was added between the two A & P Labs to accommodate an Anatomage Table, along with a large wall mounted digital display and perimeter "z-space" computer stations. This technology provides a highly immersive, and interactive environment for student learning. To highlight the new learning environment a window to the corridor was added to this room creating the opportunity for "science on display."



# Safety and Efficiency were at the Forefront of Planning

Safety was at the forefront of the planning process making the labs safe and more efficient. Both the Microbiology and A & P Labs at the MATC West Allis campus were originally designed to be interchangeable, with a shared prep area. Over the years, equipment for Microbiology increased and the quantity and variety of models for A & P increased, overcrowding both labs and prep spaces. As an outcome of the planning process, it was determined that each specialty required their own dedicated lab space with an adjacent prep area allowing for better efficiency. Perimeter cabinets and counters were added in the Microbiology Lab, increasing both storage and working space. Sinks were added at each student workstation which helped to decrease spilling and glass breakage. The Microbiology prep lab was increased in size to provide additional workspace for media prep as well as space for additional equipment, to including; instrument washing, a vented specimen storage, a laminar flow hood station, incubators, and an autoclave. Reorganizing the upper cabinets allowed staff to maximize storage, freeing up valuable counter space, providing space for two tech workstations.

In the A & P lab and prep room, previously overflowing with models, the design team redesigned the existing compact storage for smaller models. Full height cabinets were

added for taller models and skeletons for safe storage. Creating right-sized storage, freed up space for a faculty workstation and parking space for rolling carts. Carts can now be used to gather models from storage and wheel them out to the lab, minimizing lifting and carrying.

At the MATC Downtown campus, the A & P curriculum was expanded to include additional dissection sessions throughout the semester. To accommodate safer storage of the dissection specimens and to control the odors of formaldehyde, a continuously vented storage area was added to the prep room. A compact storage system and a parking area for rolling carts with upper storage was added. This additional storage eliminates materials and equipment in the labs, making for better working space and student flow in the lab. Door widths were also increased in size for safer, easier passage of equipment and carts. In addition to the physical facility changes, upgrades were included for room exhaust for better air quality and LED lights for better lighting and energy efficiency. New finishes include no-wax vinyl flooring to reduce maintenance and improved aesthetics. Accessibility accommodations were updated throughout, and student lockers outside the lab to eliminate clutter in the lab from student bookbags and personal items.





# In Conclusion

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Although it may not be possible to predict how the community college science lab of the future will look and function, creating flexible environments that can be adapted over time and easily integrate new technologies will help keep them viable. The mission of the community colleges will continue to focus on preparing students for careers through “learning by doing.” Hands-on learning in the science lab gives students the opportunity to collaborate, explore, and develop their critical thinking skills. Providing exceptional preparation for their future careers.







## **Contact**

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