COLLEGE OF SCIENCE AND TECHNOLOGY

In the College of Science and Technology excellence in teaching and learning is our highest priority.

Our departments have a long history of providing students with the depth and breadth of education needed for success in contemporary fields of science and technology. Several important points you should know about our College faculty are:

- We are experienced educators, with approximately 98 percent of the full-time faculty in the College holding doctoral degrees.
- We are active scholars who conduct research and bring our passion and knowledge into the classroom.
- We embrace the use of high-impact educational practices in the curriculum to help facilitate your education and the development of skills necessary for you to be an independent, life-long learner. Various forms of experiential learning can be found throughout the curriculum, from faculty-mentored research and internship experiences to the opportunity for students to communicate their work to members of the public as well as to the professionals within their respective disciplines.

At Millersville, we encourage our students to work TOGETHER to be STRONG, capable learners!

As you research the science and technology programs at Millersville University through our website, be sure to read the brief highlights of our departments, our student research and internship experiences, student club opportunities, as well as alumni accomplishments. After your virtual online tour, we invite you to visit our campus in person, to meet our faculty and students, see our modern facilities, and learn more about our exceptional programs.

SCIENCE AND TECHNOLOGY FACILITIES

The Millersville University Argires Science Complex includes the 88,000-square-foot Caputo Hall (constructed in 1999), the 55,000-square-foot Roddy Hall (renovated in 2001), Brossman Hall and Nichols House. The complex includes 42 teaching laboratories, 39 individual student research laboratories, specialized support laboratories, 11 classrooms, four lecture halls, a student study lounge, a student café and lounge, seminar and conference rooms, and faculty offices. Classrooms are all outfitted with multimedia technology. The Department of Computer Science has two computer teaching laboratories: the human-computer interaction laboratory and the graphics, virtual reality and haptics laboratory. This is one of the finest science facilities in the region; it houses programs in biology, chemistry, computer science, earth sciences, physics and nursing.

Wickersham Hall, home of the Department of Mathematics, houses departmental and faculty offices, as well as a mathematics computer laboratory with 36 networked PCs, each loaded with an array of mathematical software, including the Mathematica computer algebra system and the Minitab and SAS statistical software packages. Wickersham also has student study areas, a conference room, dedicated space for mathematics tutoring and eight classrooms. It was completely renovated in 2006.

Facilities for the Department of Geography, housed in McComsey Hall, include the Environmental Geography Lab and the Geo-Graphics Lab. The Environmental Geography Lab was recently completed and is the primary classroom for staging laboratory and field exercises in a variety of environmental and physical geography courses. Additionally, the facility is utilized by faculty and students as they conduct independent research projects. The Geo-Graphics Lab is the teaching classroom for GIS-based courses. The Geo-Graphics Lab is also the common study and workspace for students in all geography courses and for scheduled group tutoring. The Geo-Graphics Lab houses approximately 20 PC work stations, a large-format plotter, and color and B&W printers. Instruction in all GIS-based courses utilizes the latest software, ArcGIS and ArcGIS Pro.

Osburn Hall is a 70,000-square-foot facility designed exclusively to house programs offered by the Department of Applied Engineering, Safety & Technology at Millersville. Osburn Hall provides laboratories, classrooms, offices, research areas and other spaces that support programs in applied engineering, engineering technologies, occupational safety and environmental health, technology and engineering education, and integrative STEM education.

The lower level of Osburn Hall includes an electronics lab; an energy, power & transportation lab; and an automation and robotics lab. The main floor includes our production laboratories (manufacturing & construction), along with an innovation lab, an integrative STEM laboratory for studying technology & engineering education at the elementary level, an administrative office complex, and a 60 seat multipurpose room. The upper level of Osburn hall is dedicated to graphic communications and packaging, drafting and design, and occupational safety and environmental health (OSEH). It includes an advanced CADD lab with a rapid prototyping area, an additional CADD lab, a desktop publishing laboratory, a graphics lab a CNC packaging lab, and a series of laboratories associated with the OSEH program, including fire science, confined space, safety engineering and industrial hygiene.

Millersville University has an extensive inventory of modern instrumentation that students use in classroom work and for independent study and research. Included are four large environmental chambers, autoclaves, optical microscopes, an atomic force microscope, an optical polarizing microscope, a scanning electron microscope, several types of spectrophotometers (FT infrared, visible-ultraviolet, 400 MHz FT nuclear magnetic resonance, and atomic adsorption), a gas chromatograph/mass spectrometer, a Raman spectrometer, a scintillation counter, phase contrast microscopes, optical bench components, a vibration-isolating table for holochemistry and optical interferometry, a cryogenics unit, an excimer laser, an X-ray spectrometer, a cosmic ray muon detector, electrophoresis equipment, thermocyclers, ultramicrotomes, high-speed and tabletop centrifuges and microscopes, laminar flow hoods, CO2 incubators for tissue culture, ultralow freezers, an ultracentrifuge, several gas chromatographs, an electrochemical oxygen analyzer, an auto-analyzer, a high-vacuum system, equipment for microwave behavior study, and hardware/software for data capture. Field equipment includes a dissolved oxygen probe, flow meters, a backpack electroshocker, PIT tagging equipment, active infrared monitors, a fluorometer, digital cameras, video cameras, turbidity meters, a microbalance and extensive air-sampling equipment. Additional science facilities include botanical greenhouses, a limnological research pond, the Keefer ecological study area, several microcomputer-based laboratories, photographic darkrooms, and cold rooms. There are museum reference collections of mammals, birds, fishes, insects and other invertebrates, and modern animal-care facilities, including special aquatic "wet" rooms for maintenance of animals and research. There is an extensive botanical collection.
Millersville University meteorology has assembled a suite of instruments and associated equipment in support of boundary layer (BL) and atmospheric chemistry research and education. The BL component of this facility, referred to as the Millersville University Atmospheric Boundary Layer (MABL) facility, is mobile and has been deployed for several field projects from Philadelphia to California. MABL consists of the following: Rawinsonde and Tethered Balloon Sounding systems; Scintec MFAS Acoustic Sodar with radio acoustic sounder; Sigma Space micropulse LiDAR with cross-polarization; a 10-meter flux tower; trace gas analyzers and particle-scattering instruments; and trailer. Millersville also has its own Weather Research and Forecasting (WRF) Modeling System that is used for operational forecasting and in support of the observational studies and throughputs over 100 Gb per day of satellite, radar, model, upper air, and surface data and data products. Millersville meteorology supports a modern weather center, complete with an electronic map wall and streaming video production.

The geology program has a license for RockWorks software. Geophysical equipment includes a proton precession magnetometer, an Earth resistivity meter and a stacking seismograph with multiple geophones. The program has a sand-tank groundwater flow model and GMS-MODFLOW numerical groundwater modeling. The program also maintains a broadband seismograph that is part of the Lamont-Doherty Earth Observatory’s Cooperative Seismic Network. The Earth Surfaces Processes Laboratory maintains equipment needed for preparing rock and soil samples for chemical and mineralogical analyses. A full suite of field water-sampling equipment is available for studies involving the chemistry and sediment of surface water. This includes handheld pH and conductivity meters. A total surveying station is available for topographic studies requiring accurate determination of elevation and distance, such as is used in hydrologic and geophysical studies and for LiDAR-derived elevation validation.

The ocean science and coastal studies program maintains a dedicated remote sensing laboratory equipped with ENVI/IDL software and state-of-the-art LiDAR processing hardware and software, including Terrasolid, LP360, Global Mapper, LasTools and Microstation. The program also maintains two CTDs, including a Seabird SBE 25 equipped with LiCor light sensors, a backscattering sensor, a YSI oxygen sensor, a fluorometer, an acoustic current meter and a newly acquired portable weather station. Millersville University is a senior full member of the Chincoteague Bay Field Station (CBFS) at the Marine Science Center at Wallops Island, Virginia, with full access to facilities, including two monitor boats, the R.V. Flatfish and R.V. Mollusk. Both are approximately 45 feet in length and are used primarily in the tidal creeks and backbay areas for trawling and sampling. The R.V. Phillip N. Parker is a 47-foot crew vessel used mostly for cruises beyond the inlet and up to 25 miles offshore. CBFS also maintains a fleet of kayaks that allow access to cypress swamps, shallow tidal creeks and flats, and other areas where our motorized vessels cannot go.

The department also maintains two rotating tables to conduct experiments in geophysical fluid dynamics for teaching and research, a hydrogen-alpha solar telescope, a National Acid Deposition Program sampling site off campus, and a Geo-graphics Lab running ARCGView, ARCGIS (3-D Analyst, Spatial Analyst, Geostatistical) and Watershed Modeling System.

The programs

- Advanced Manufacturing Technology Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/advanced-manufacturing-technology-minor/)
- Allied Health Technology, B.S. - Pre-Athletic Training Dual-Degree Option (https://catalog.millersville.edu/undergraduate/college-science-technology/biology/allied-health-technology-bs-pre-athletic-training-dual-degree-option/)
- Allied Health Technology, B.S. - Medical Technology 3+1 Year Option (https://catalog.millersville.edu/undergraduate/college-science-technology/biology/allied-health-technology-bs-medical-technology-3-1-year-option/)
- Allied Health Technology, B.S. - Nuclear Medicine Technology 3+1 Year Option (https://catalog.millersville.edu/undergraduate/college-science-technology/biology/allied-health-technology-bs-nuclear-medicine-technology-3-1-year-option/)
- Applied Engineering & Technology Management, B.S. - Construction Management (https://catalog.millersville.edu/undergraduate/college-
Biology Minor

- Biochemistry Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/biochemistry-minor/)
- Biology Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/biology/minor/)
- Biology, B.S. (https://catalog.millersville.edu/undergraduate/college-science-technology/biology/bs/)
- Biology, B.S. - Biotechnology Option (https://catalog.millersville.edu/undergraduate/college-science-technology/biology/bs-biotechnology-option/)
- Biology, B.S. - Medical Technology Option (https://catalog.millersville.edu/undergraduate/college-science-technology/biology/bs-medical-technology-option/)
- Biology, B.S. - Nuclear Medicine Technology Option (https://catalog.millersville.edu/undergraduate/college-science-technology/biology/bs-nuclear-medicine-technology-option/)
- Biology, B.S. - Optometry Option (https://catalog.millersville.edu/undergraduate/college-science-technology/biology/bs-optometry-option/)
- Biology, B.S. - Pre-Medical Professions Option (https://catalog.millersville.edu/undergraduate/college-science-technology/biology/bs-pre-medical-professions-option/)
- Biology, B.S. - Pre-Podiatry Option (https://catalog.millersville.edu/undergraduate/college-science-technology/biology/bs-pre-podiatry-option/)
- Biology, B.S.Ed. (https://catalog.millersville.edu/undergraduate/college-science-technology/biology/bsed/)
- Chemistry Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/chemistry/minor/)
- Chemistry, B.S. (https://catalog.millersville.edu/undergraduate/college-science-technology/chemistry/bs/)
- Chemistry, B.S. - Biochemistry Option (https://catalog.millersville.edu/undergraduate/college-science-technology/chemistry/bs-biochemistry-option/)
- Chemistry, B.S. - Polymer Chemistry Option (https://catalog.millersville.edu/undergraduate/college-science-technology/chemistry/bs-polymer-chemistry-option/)
- Chemistry, B.S. - 3+4 Pre-Pharmacy Option (https://catalog.millersville.edu/undergraduate/college-science-technology/chemistry/bs-34-prepharmacy-option/)
- Chemistry, B.S. - Environmental Option (https://catalog.millersville.edu/undergraduate/college-science-technology/chemistry/bs-environmental-option/)
- Chemistry, B.S. - Nanotechnology Option (https://catalog.millersville.edu/undergraduate/college-science-technology/chemistry/bs-nanotechnology-option/)
- Chemistry, B.S.Ed. (https://catalog.millersville.edu/undergraduate/college-science-technology/chemistry/bsed/)
• Computer Science Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/computer-science/computer-science-minor/)
• Computer Science, B.S. (https://catalog.millersville.edu/undergraduate/college-science-technology/computer-science/computer-science-bs/)
• Construction Technology Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/applied-engineering-safety-technology/construction-technology-minor/)
• Control Systems Technology Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/applied-engineering-safety-technology/control-systems-technology-minor/)
• Data Science Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/computer-science/data-science-minor/)
• Earth Sciences Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/earth-sciences/earth-sciences-minor/)
• Environmental & Spatial Sciences, B.S. (https://catalog.millersville.edu/undergraduate/college-science-technology/environmental-chemistry-minor/)
• Environmental Chemistry Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/chemistry/environmental-chemistry-minor/)
• Environmental Geology Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/geography/environmental-geology-minor/)
• Environmental Hazards and Emergency Management Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/earth-sciences/environmental-hazards-emergency-management-minor/)
• Environmental Policy and Regulation Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/environmental-studies/environmental-policy-regulation-minor/)
• General Geography Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/geography/general-geography-minor/)
• Geography B.A. - Environmental Studies Option (https://catalog.millersville.edu/undergraduate/college-science-technology/geography/environmental-studies-option/)
• Geography, B.A. - Geospatial Applications Option (https://catalog.millersville.edu/undergraduate/college-science-technology/geography/geospatial-applications-option/)
• Geography, B.A. - Global Studies Option (https://catalog.millersville.edu/undergraduate/college-science-technology/geography/geography-bs-global-studies-option/)
• Geography, B.A. - Sustainability Studies Option (https://catalog.millersville.edu/undergraduate/college-science-technology/geography/geography-bs-sustainability-studies-option/)
• Geology Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/earth-sciences/geology-minor/)
• Geospatial Applications Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/geography/geospatial-applications-minor/)
• Global Geography Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/geography/global-geography-minor/)
• Graphic Communication Technology Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/environmental-chemistry-minor/)
• Heliophysics and Space Weather Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/heliophysics-space-weather-minor/)
• Hydrology Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/earth-sciences/hydrology-minor/)
• Industrial and Environmental Health Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/industrial-and-environmental-health-minor/)
• Integrative STEM Education Methods Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/integrative-stem-education-methods-minor/)
• Land-Use Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/land-use-minor/)
• Manufacturing Engineering Technology, B.S. (https://catalog.millersville.edu/undergraduate/college-science-technology/manufacturing-engineering-technology-bs/)
• Mathematics Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/mathematics/mathematics-minor/)
• Mathematics, B.S. (https://catalog.millersville.edu/undergraduate/college-science-technology/mathematics/mathematics-bs/)
• Mathematics, B.S.Ed. (https://catalog.millersville.edu/undergraduate/college-science-technology/mathematics/mathematics-bsed/)
• Mathematics, B.S.Ed. - Actuarial Science Option (https://catalog.millersville.edu/undergraduate/college-science-technology/mathematics/mathematics-bsed-actuarial-science/)
• Meteorology Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/earth-sciences/meteorology-minor/)
• Meteorology, B.S. (https://catalog.millersville.edu/undergraduate/college-science-technology/earth-sciences/meteorology-bs/)
• Molecular Biology/Biotechnology Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/biology/molecular-biologybiotechnology-minor/)
• Nursing, B.S.N. (https://catalog.millersville.edu/undergraduate/college-science-technology/nursing/nursing-bsn/)
• Oceanography Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/earth-sciences/oceanography-minor/)
• Physics Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/physics/physics-minor/)
• Physics, B.S. (https://catalog.millersville.edu/undergraduate/college-science-technology/physics/physics-bs/)
• Physics, B.S.Ed. (https://catalog.millersville.edu/undergraduate/college-science-technology/physics/physics-bsed/)
• Quantitative Methods in Environmental Science Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/environmental-studies/quantitative-methods-environmental-science-minor/)
• Social Studies, B.S.Ed. - Geography Advised (https://catalog.millersville.edu/undergraduate/college-science-technology/geography/social-studies-bsed/)
• Statistics Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/mathematics/statistics-minor/)
• Sustainability Studies Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/geography/sustainability-studies-minor/)
• Technology & Engineering Education (K-12), B.S.Ed. (https://catalog.millersville.edu/undergraduate/college-science-technology/applied-engineering-safety-technology/technology-engineering-education-bsed/)
• Technology & Engineering Education Minor (https://catalog.millersville.edu/undergraduate/college-science-technology/applied-engineering-safety-technology/technology-engineering-education-minor/)