



AUTOMOTIVE TECHNOLOGY

It's been said that we are no longer driving cars but driving computers. ARC prepares students for this new reality by combining classroom and hands-on shop experience for careers in all phases of automotive service and repair on all types of vehicles, from everyday passenger cars and light-duty trucks, to high tech alternative fuel vehicles and high performance street machines.

ARC expects more than 400 students each semester to enroll in automotive classes in the new Career Technical Education building. Many are working on an Associate's Degree or Certificate(s) of Achievement or use their classroom experience to help prepare for the Automotive Service Excellence (ASE) exams, using their hands-on experience on campus and in internships to count toward the ASE Certification working requirement.

Students are trained in the latest diagnostic and repair of modern vehicles in traditional and computerized formats, using handheld meters and scanners, and special shop tools including power and hand tools. Instruction and practice are provided in the diagnosis and repair of engines, ignition systems, fuel systems, brakes, manual and automatic transmissions, steering and suspension, including alignment, heating and air conditioning systems and emission controls.

The program is currently housed in a building original to the campus that was not designed for an automotive program nor its specialized equipment. While the faculty have done an admirable job in adapting this aging facility, this popular field of study urgently needs a new modern space that can accommodate current technology, and specifically the growing alternative fuel and hybrid vehicle programs.



“My education at ARC has led me from changing oil in 2005 to supervising 13 stores for AutoNation. When I hire service technicians, I know that ARC graduates have a lot of hands-on experience. Students from other schools may have been told or shown how to do something - like an alignment - but ARC grads have not just studied how to do them but have done 15 - 20 of them. The experience makes a difference on the job right away.”

—Neil Patel, Automotive Technology Alumnus

The new automotive technology space is designed so faculty have unobstructed views and can effectively monitor students as they work in the auto bays, transmission and engine labs or the engine machine shop. The labs simulate the workflow of a modern car dealership or high-end repair shop. This includes a large auto yard adjacent to the building where, unlike many other automotive programs, students learn to find cars in the lot, drive them into bays and put them on lifts, a skill that makes them more marketable as they enter the workforce. The program will be on display as observers on the second floor can look down through the glass walls to see the myriad of activities underway on the ground floor.



ELECTRONICS TECHNOLOGY

Our region's workforce depends upon students knowledgeable in electronics, whether they are working as an electronic technician designing, developing, building, installing, repairing, or maintaining many different types of sophisticated electronic devices, or using their electronics knowledge to support another career, such as automotive repair.

Designed by faculty, this exemplary program tailored for the adult learner combines technical rigor and curricular flexibility with hands-on experience.

The Electronics Technology Program links broad based Electronic and Telecommunications training with the newest specialty areas (such as Robotics, Fiber Optics, Industrial Electronics, Solar, Biomedical and Microcontrollers). These cutting edge subjects are now taught in a building that was built when transistor radios were revolutionary.

The new Tech Ed facility will enhance students' educational experience by providing spaces for the students to stay on campus for studying, collaboration, or to meet with their professors. The new soldering lab, telecommunications and fiber optics lab, general electronics lab, tool room, solar lab, and an outside solar pad will be easily accessible. The new state-of-the-art learning environment will help inspire students and help them to inspire their peers.

Working closely with industry partners, ARC faculty ensures the curriculum remains up to date and meets current and future industry needs in this complex and rapidly changing field. This relevant education prepares graduates for excellent career opportunities in the Electronics, Robotics or Telecommunications



“My studies at ARC helped me in so many ways. I knew nothing about electronics when I started but the professors took a genuine interest in students and always went over and above to help anyone struggling to master the concepts. They took the time to show me how my strengths could match occupational possibilities, steering me toward programs in biomedical engineering and electronics which, ultimately, led to my career with a biomedical radiological company.”

—Jean Luc, Electronics Technology Alumnus

fields. Students may choose to pursue one of two Associate's Degrees, or 11 Certificate(s) of Achievement, to pursue an FCC license to work in radio and telecommunications, or matriculate into a four-year engineering program.

The ARC Electronics Technology curriculum prepares approximately 700 students per semester for excellent career opportunities in the Electronics, Robotics or Telecommunications fields. Students may choose to pursue one of two Associate's Degrees, or 11 Certificate(s) of Achievement, to pursue an FCC license to work in radio and telecommunications, or matriculate into a four-year engineering program.



ELECTRICIAN TRAINEE

Homes and businesses all require licensed electricians to install necessary components for new construction and remodels, making the field in high demand. The Bureau of Labor Statistics estimates that jobs for electricians are projected to grow eight percent annually through 2029, much faster than the average for all occupations.

As one of the few electrician training programs in the region, the program provides instruction in the installation, operation, and maintenance of residential and commercial electrical distribution systems. Faculty working in the field are knowledgeable about expectations of current employers and cover topics that include safety training, AC/DC electrical theory, metering, electronics, use of electrical codes, raceways, conductors, grounding, motors, transformers, fire alarm systems, fiber optics, and Heating, Ventilation, and Air Conditioning (HVAC) systems. The program complies with strict state regulations to become an electrician trainee per the California Department of Industrial Relations' electrician trainee guide.

ARC's current electrician trainee program shares labs with the automotive program, creating scheduling barriers for both programs and constraining the electrician trainee program classes to weekends only.



Upon receipt of the Certificate of Achievement in Residential/Commercial Electrician Trainee students may find employment in government, residential and commercial construction and maintenance, utilities, and facilities management.

The new Career Technical Education building will provide additional space for the program, allowing class schedules to expand beyond weekends to weekdays, so the current enrollment of 40 – 50 students per semester is expected to increase, providing more skilled electricians in this high demand career for the region's workforce.



ENERGY (SOLAR)

According to the U.S. Department of Energy, enough energy from the sun reaches Earth every hour to meet the world's energy usage for an entire year. As solar power becomes more cost-effective, it has the potential to make up a larger share of growing U.S. energy needs. And as it expands in usage, there will be a growing need for more workers, including manufacturing workers to make solar panels, construction workers to build power plants, and solar photovoltaic installers to install solar panels.

The new Career Technical Education building, with a solar lab and outside solar pad that is easily accessible, will help students get the experience they need to enter their career. The Energy (Solar) program's lab provides a designated space where students explore both the fundamentals and advanced components of a solar system. And, because the lab is no longer sharing space with another program, design projects can be left intact, providing more time for more complex projects and deeper learning.

Many students enroll in these classes to begin their career, while others are already working in the field but need to upgrade their skills to include the newest advancements in solar technology. Faculty, many of whom are working in the industry, offer first-hand knowledge of skills needed for successful careers and provide students with contacts that can help them land jobs.



ARC attracts approximately 50 students per semester for classes in this growing field. Two Certificates are offered. The Certificate of Achievement in Solar Energy Systems Design, Estimation, and Sales Certificate provides training in all aspects of solar photovoltaic (PV) system design, cost estimation, sales, and installation. It also includes training in oral presentations and management skills.

The Solar Energy Technology Certificate provides training in all aspects of solar photovoltaic (PV) system design, installation, troubleshooting, and repair.

The courses included in both certificates qualify students to take the North American Board of Certified Energy Practitioners (NABCEP) PV Associate Certificate of Knowledge Exam, as well as earn OSHA cards required by many employers.

WELDING TECHNOLOGY

Welding is a high-demand skill throughout the U.S., with California boasting the second highest number of jobs in this field, according to a recent report by the Bureau of Labor Statistics (BLS). The BLS estimates the U.S. will need 400,000 new welders to fill jobs by 2025, and with a median wage of \$41,380 (which more than doubles for workers willing to work in challenging conditions), students are increasingly attracted to this career path.

ARC's Welding Technology program is poised to meet this increasing demand for welders with the construction of the new Career Technical Education building. Currently housed in a space designed to accommodate 12 students, faculty have leveraged every inch to enroll 45 students, with students turned away each semester because of space constraints. Welding, like other fields, has become high-tech. Once a single process, welding now encompasses literally hundreds of different processes, which must be taught in modern welding instruction, and students need both classroom and lab space to hone their skills.

The Career Technical Education building will offer ample space for instruction and space for hands-on learning that simulates the work environment. Building plans include an outdoor welding yard for large fabrication projects, welding labs as centers for

The Welding Technology curriculum, combined with the collaborative environment, will help prepare 48 students each semester for traditional welding processes and the use of robots and other automated systems that use lasers and electron beams to bond metals. Students can work toward an Associate's Degree in Welding Technology, or one of seven specialized Certificates.



“I was struggling on the job site and enrolled in ARC's welding program to improve my skills in welding and in reading blueprints.

The environment felt like home – the faculty were very supportive but pushed me to learn and reach my goals. I have since been promoted and am now a Welding Educator at Siemens – teaching others about welding! Since graduation, I am grateful to continue to benefit from the great network of other welders I met through ARC.”

—Reyna Sanchez, Welding Alumna

hands-on learning where students apply the theory to projects, and collaborative space that offers equipment and technology for collaboration between welding and other tech programs. The curriculum, combined with the collaborative environment, will help prepare ARC's welding students for the use of robots and other automated systems that use lasers and electron beams to bond metals.

ARC's welding faculty have decades of industry experience and work closely with local employers and partners, such as the American Welding Society to ensure that the curriculum meets the ever-changing needs in industry and that students will gain the skills and training to have a successful career.

DESIGN AND ENGINEERING TECHNOLOGY

Students in the Design and Engineering Program at ARC are at the core of innovation as they bridge the gap between traditional engineering and design by applying design principles to solve real-world problems.

With jobs in high demand, the program attracts students from a variety of ARC departments, along with others who have returned to college to obtain new skills to advance their careers. Regardless of their age or stage in school/career, students know that they can become technically competent in a diverse array of software packages whether their interest is in architectural, mechanical or civil engineering, landscape design, or interior design.

To support this diverse student population, ARC plans to invest in new equipment to enable the transition to fully flexible technology to support three popular modes of teaching: in-person on campus, live online and recorded online. The model presents multiple avenues through course content, working well for courses where students arrive with varying levels of expertise or background in the subject matter.

And, as industry equipment changes, so will the ARC student experience, thanks to virtual technology. Just as pilots use flight simulators that mimic different aircraft before ever entering a real cockpit, ARC students can virtually operate a variety of high-tech software found in the workplace. Whether at home or on campus, students can “practice” with sophisticated current industry-standard equipment from high-tech milling machinery, land survey tools and high-tech software. This approach allows students to gain as much experience as they need to become



More than 150 students each semester are expected to be a part of this highly collaborative curriculum, building skills while creating their portfolio. Three Associates Degrees are offered:

- A.A. in Design Technology, A.S. in Engineering Technology, and A.S. in Mechatronics.
- Certificates of Achievement are available in Design Technology, Engineering Technology, Mechatronics, and a Basic Mechatronics Certificate.

knowledgeable and comfortable with operating a wide variety of complex and expensive equipment before they actually lay hands on it in labs, or in the workplace.

To ensure that students can build the portfolios that are now necessary in the job market and in transferring to a four-year institution, two labs on the second floor of the new building will provide leading-edge equipment for hands-on projects that foster learning and add to student marketability for their path forward.

THE DESIGN HUB

The Design Hub at ARC is at the intersection of where the “four c’s” (creative thinking, critical thinking, collaboration, and communication), meet technology literacy. Steeped in multidisciplinary collaboration, each semester paid student interns are tasked with solving a real problem for a Design Hub client, which could be a community-based business or start-up, nonprofit, or ARC department.

Under faculty supervision, students are assigned concrete deliverables as specified by the client, and often tasked to work as a team across disciplines to accomplish the tasks. Just as in industry, there are quality standards to be met and regular production meetings to ensure on budget/on-time delivery. The students earn wages, college credits for the project, gain real-world experience in teamwork and problem-solving skills, and are ultimately rewarded with a product outcome that will be used by the client. Projects may range from creating detailed colored and textured models of cell membranes for ARC’s Science classes, to an exhibit designed for the Aerospace Museum of California - an interactive wind tunnel that through virtual reality can simulate 1,500 different airfoils, vectors, and angles.

The Design Hub space will also offer opportunities for students to acquire the skills needed to be successful in creating Virtual Reality (VR) content for applications for industry and training. Now commonly used in fields such as architecture, product visualization, game creation, multimedia design and broadcast media, students with experience in VR are highly marketable. One example of a VR project is the simulation of a construction project, where students walk a site, clear, grub, excavate, fill, pour pad, build

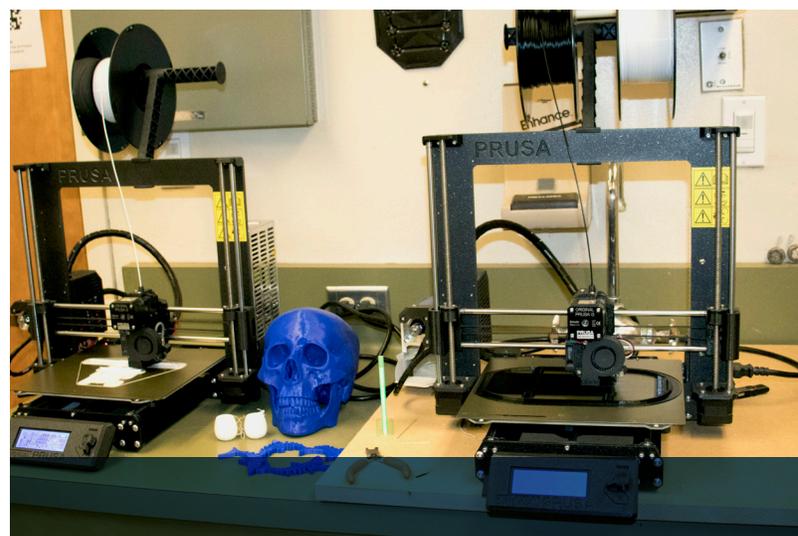


“I spent three semesters in the Design Hub and appreciated the quality of experiential learning that I just didn’t get at the four-year university level. There is a real workplace mentality there - real pay, a real contract to fulfill, real clients, and a set budget. In addition to technical skills, I learned about production values and teamwork, all of which I use on a daily basis.”

— Sean Franklin, Design Hub Alumnus

per plan, inspect, and survey. Upon completion, students have a digital copy of their work they can use to build their professional portfolios.

The new facility’s open plan is designed to showcase the myriad of student projects in their various design and production phases, drawing in both new interns and projects.





MAKER SPACE 1 (COLLABORATION SPACE) AND MAKER SPACE 2 (PROTOTYPING LAB)

Inclusive, welcoming Maker Spaces in the new Career Technical Education building, are extensions of the classroom where ARC students from any area of study can access specialized equipment and make abstract concepts come to life. Here is a place where imaginations are unleashed and students develop the skills and mindset for them to become makers - that is, to be innovative, creative, and technical. Conceived for collaboration across disciplines, art students might bring their skills to a project design in cooperation with engineering technology and electronics students. As with the rest of the building, the work is conducted in an open environment conducive for sparking and sharing new ideas.

Maker Space 1 will focus on smaller-scale production and offer tools such as computers and monitors for programming, and 3-D printers. Maker Space 2 will offer heavy machinery such as CNC lathes, a laser cutter, water jet, and plasma cutters. Here, welding students

will be able to gain work experience collaborating on fabrication projects to be used for the campus as well as for local organizations.

Both spaces will also be used for interdisciplinary classes. ARC's drone class is an example of a class initiated through interdisciplinary collaboration. Beginning with a design student using the Design Hub's 3-D printer to print the frame of a drone, finding electronics for the frame, and together students and faculty built a functional drone. When other students from across the campus expressed interest in drone technology, they founded a drone club. The demand drove the formation of a formal for-credit class where students learn both about the safe and proper operation of flying drones and interpreting the data that drones produce. Students who take the class and become certified as an FAA Remote Pilot find an array of career opportunities. These include but are not limited to video and photography, agriculture, construction, delivery services, emergency services, and engineering, and the applications expand every day.



FUNERAL SERVICE EDUCATION

The Funeral Service Education Program at ARC is truly one of a kind in the nation. As the only working mortuary in the U.S. housed in a college, and only one of two community colleges in California to offer a Funeral Service Education program, ARC prepares students for entry-level employment in the funeral services industry.

Unlike other high-tech programs housed in the Career Technical Education building, the program is based upon thousands of years of history and tradition yet has developed curriculum that follows industry trends toward natural or green burials. Currently the program's coursework in biology, chemistry, funeral service management, embalming, restorative art, funeral service fundamentals, counseling, accounting, and funeral service law and ethics is conducted on the ARC campus while the hands-on clinical components are offered with local funeral industry partner sites.

Approximately 60 students – many of whom feel this work is a calling – enroll in Funeral Services classes each semester. This path will allow students to meet the prerequisite for licensure and employment in the funeral service industry as funeral directors and embalmers. ARC's program is also accredited by the American Board of Funeral Service Education (ABFSE).

The combination of classes and internships with industry partners will remain as the program moves to the Career Technical Education building but will be enhanced by new spaces in the facility. The Funeral Services area will look much like a modern funeral home. In addition to an embalming room, a restorative arts lab and a funeral service lab, the



“Initially, I didn't have an interest in management, but while I was at ARC I learned a lot about modern business practices, and how to approach clients who are going through a very difficult experience and who are often very emotional. I finished my apprenticeship in 2012 and became a licensed embalmer in that same year. By 2014 I had gained experience in managing multiple locations. I am now managing four locations in Sonoma County.”

—Matthew Disbrow,
Funeral Service Education Alumnus

new facility will have arrangement offices to meet with families, a reception area for families, a viewing room, and a chapel for services available to the public in a new partnership with the Sacramento County Coroner to offer low-income families who have recently lost a loved one a full-service funeral. This unique program will help families who could not otherwise afford a funeral to bury their loved one with dignity, but also provides students the full workplace experience – from picking up the body from the coroner, to preparing the body, to working with the family to design a service.