# Digital Instrumentation and Process Control

**What is the Digital Instrumentation and Process Control Program?**
The Digital Instrumentation and Process Control Program prepares students for entry into a broad range of computer-automated commercial, industrial, and residential jobs that include: manufacturing, alternative energy power distribution, smart homes building management systems, power generation, biotechnology, medical, and HVAC. The program focuses on hands-on application, where instrumentation knowledge is critical. HCC's A.A.S. degree can also be applied towards employment or advanced degrees.

**What skills are needed to excel in this field?**
Individuals who excel in digital instrumentation possess a strong analytical aptitude, are naturally inquisitive, and enjoy hands-on activities. In addition, they have an excellent attention to detail; good communication skills; the ability to think logically and come up creative solutions; excellent problem-solving skills; strong math skills; and the ability to work well with others.

**What types of jobs do technicians perform?**
Instrumentation or process control technicians perform a variety of tasks on sophisticated instrumentation-based equipment and automated systems, such as:

- Assisting in specification and design
- Installation and configuration
- Maintenance and support

These technicians often work closely with engineers and managers and through additional education can enhance their skills in order to enter a career in management or engineering.

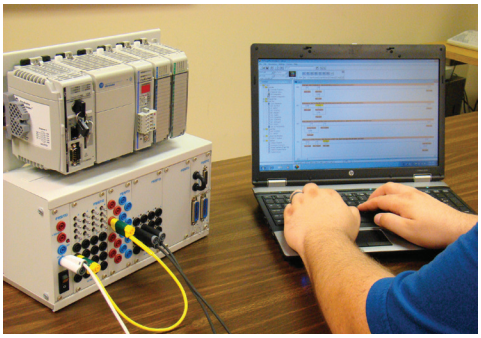
**Why choose the Digital Instrumentation and Process Control Program?**
Technology advancements in microprocessor-based digital instrumentation have created a demand for qualified technicians and application engineers with a well-rounded skill-set. Automation of processes using complicated instrumentation has become the norm in industries around the world and in equipment used everywhere. The need for skilled workers to design, understand, operate, maintain, and troubleshoot this equipment has increased as a result, bringing increased opportunities for rewarding careers.

**What are the average earnings?**
Earnings will vary by education, job, and geographic location. Median annual wages of electrical and electronics repairers of commercial and industrial equipment were $51,220 in 2012 with the top 10 percent earning more than $75,740 (source: *www.bls.gov/ooh*).

HCC's A.A.S. degree, however, can be applied towards a variety of positions that may achieve much greater income, depending on experience and specific skills developed. Regional businesses have reported yearly salaries in excess of $80,000 per year for workers with 10 or more years of experience.

**What is the employment outlook?**
Employment of electrical and electronics installers and repairers of commercial and industrial equipment is projected to grow 3 percent from 2012 to 2022 (source: *www.bls.gov/ooh*).

**What do digital instrumentation and process control students learn?**
Students in the Digital Instrumentation and Process Control Program learn all the necessary skills to perform in today's technical environment. These include AC and DC electronics, measurement of pressure, level, flow, temperature, proportional control concepts, Integral control concepts, PID controllers, data

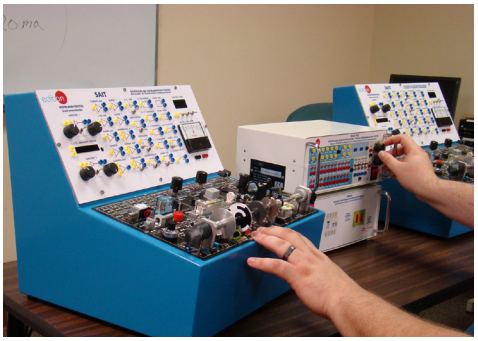


collection and reporting, system maintenance, PLC (Programmable Logic Control), SCADA (Supervisory Control And Data Acquisition), embedded PC machine controls, automation and automation system networking.

**What makes HCC's program special?**
As a state-wide designated program, out-of-county and out-of-state students may be eligible for in-county tuition. HCC's continued investment in facilities and state-of-the-art teaching tools also offers students a competitive edge as they enter the workforce or continue their education. Program instructors have critical industry experience to provide the applications knowledge to make this program instantly useful.

In addition, HCC's A.A.S. degree trains students for many of the tasks traditionally performed by engineers with a four-year degree. As a result, this program is an excellent stepping stone for students interested in completing an engineering degree.

**What other industries does the program support?**
HCC's program supports design, biotechnology, the medical field, municipal waste-water treatment systems, electric vehicles, smart building technology, and future smart grid applications.



**Does HCC offer a separate automation program?**

Yes, HCC now offers a new automation certificate program that provides students with credentials for a career in the growing area of automation, an area that is rapidly becoming standard in manufacturing, commercial controls, and even residential buildings.

*A.A.S. Degree*

# Digital Instrumentation and Process Control

The Digital Instrumentation and Process Control Program prepares students for a career in the growing area of microprocessor based instrument technology. Built upon a solid foundation of technical skills in electricity and electronics, students will learn the function and features of a variety of digital instrumentation components and systems used in commercial as well as industrial settings. Students will learn PLCs, SCADA (Supervisory Control and Data Acquisition), PAC, and microcomputer control systems and how to implement and service these systems. The methods of instruction include hands-on training as well as classroom instruction using equipment and software typically found in various industries.

**General Education Requirements 21-22 credits**

**Arts/Humanities**
- Select from approved General Education course list ..... 3

**Behavioral/Social Sciences**
- Select from approved General Education course list ..... 3

**Biological/ Physical Science**
- PHY 112 Applied Physics ..... 3

***OR***

- PHY 201 General Physics I ..... (4)

**Diversity**
- Select from approved General Education course list ..... 3

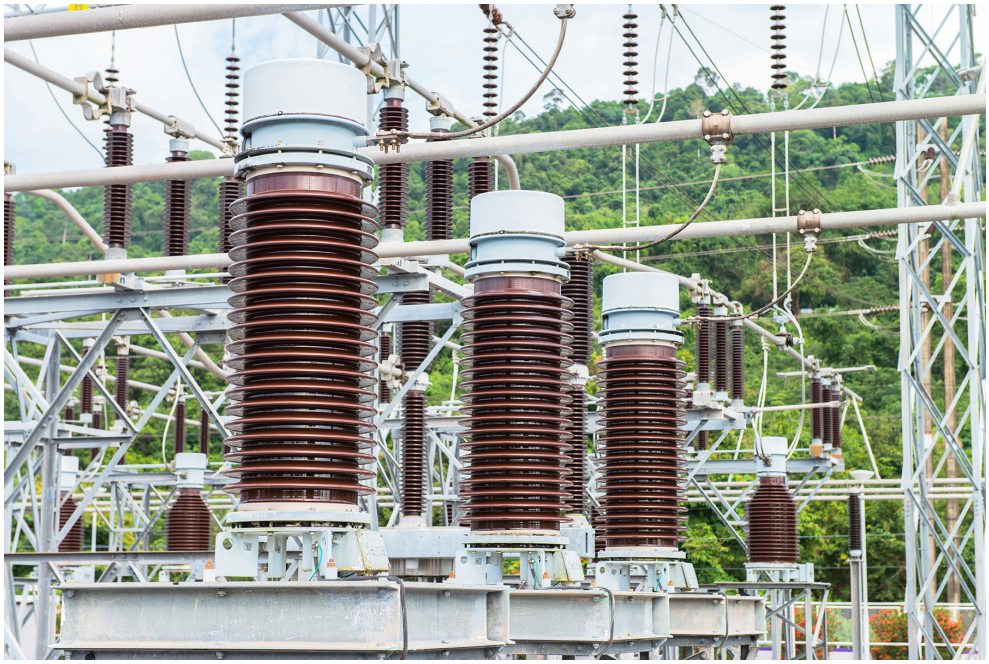
**English**
- ENG 112 Technical Writing ..... 3
- Select from approved General Education course list ..... 3

**Mathematics**
- MAT 101 College Algebra ..... 3

***OR***

- MAT 114 Introduction to Applied Algebra ..... (3)

**Program Requirements 33 credits**
- ELE 101 Device Data System Architectures ..... 3
- ELE 103 Analog and Digital Electronics ..... 3
- ELE 205 Repair and Maintenance for Instrumentation ..... 2
- ELE 210 Energy System Management ..... 3
- ELE 235 Advanced Concepts and Applications of Instrumentation and Controls ..... 3
- INT 101 Introduction to Industrial Technology . 3
- INT 102 Introduction to PLCs ..... 3
- INT 110 Fundamentals of Electricity ..... 4
- INT 113 Instrumentation and Process Control I ..... 3
- INT 213 Instrumentation and Process Control II ..... 3
- IST 102 Introduction to Information Technology ..... 3



**Restricted Electives 6 credits**

Select from the following:
- ELE 215 SPC and Device Data Management ... (3)
- ELE 269 Internship ..... (3)
- INT 103 PLC Applications ..... (3)
- INT 104 Facilities Safety and Compliance ..... (3)
- INT 107 Heating, Ventilation, Air Conditioning and Refrigeration (HVAC/R) ..... (3)
- INT 158 Advanced Motors, Machines, and Mechanical Devices ..... (3)
- IST 154 Networking Basics ..... (3)
- IST 160 Introduction to Security Fundamentals ..... (3)

**Degree Requirements ..... 60**


**Contact Information:**

Patricia Irwin
Instructor,
Electrical Engineering Technology
240-500-2668
*pairwin@hagerstowncc.edu*


**Recommended Professional Organizations:**

International Society of Automation (ISA)
*www.isa.org*