

ADVANCED MANUFACTURING & AUTOMATION TECHNOLOGY

Advanced Manufacturing & Automation Technology with Specializations in

- Advanced Manufacturing
- Supply Chain Automation

Associate in Science Degree (CIP# 1615000001)

The Advanced Manufacturing & Automation Technology Associate in Science (A.S.) degree is designed to train you to become a skilled technician capable of installing, repairing and maintaining equipment and systems used in operations that involve manufacturing and production, logistics, and supply chain automation technology.

This state-of-the-art program offers a broad background in electronics, industrial components, computer control software and hardware applications, industrial control circuits, programmable logic controllers (PLCs), hydraulics, pneumatics, welding and robotics. You will also receive specialized courses in automated manufacturing and material handling distribution systems, including automated process control—preparing you to work in trades such as manufacturing, food production, supply chain and distribution industries, as well as servicing and maintaining amusement park rides.

Students are strongly encouraged to consult a career program advisor in the department office for assistance in determining the best education plan for their career goals.

Although scheduling may not always provide for the following progression of courses, students should use the foundation, intermediate and advanced course sequence as a guide in program planning.

All degree-seeking students must satisfy entry testing requirements and satisfactorily complete all mandatory courses in reading, student success, mathematics, English, and English for Academic Purposes in which the student is placed.

Alternative Ways to Earn Credit toward this Degree

Graduates of specific programs at Orange Technical College and Osceola Technical College, as well as other institutions may be eligible to receive college credit for courses in this program. You may also be eligible to receive credit toward this degree if you have earned one of the approved Gold Standard industry certifications or Career Pathways credit. To learn more about Valencia's award of credit options, visit <https://valenciacollege.edu/academics/programs/as-degree/alternative-award-of-credit-agreements.php>. Eligible students should contact the Career Program Advisor in their academic department for more information about the requirements for the award of credit.

College Credit Technical Certificates

The Engineering Technology A.S. degree also offers the following college credit certificate programs. These certificates can put you on the fast-track to reaching your career goals. They are designed to equip you with a specialized skill set for entry-level employment or to upgrade your skills for job advancement. Most can be completed in one year or less, and all of the courses in the certificates are embedded in the A.S. degree.

You can earn the certificates as you progress through your A.S. Degree or as a separate, stand-alone credential. Click on the Technical Certificates tab at the top of the page for more information about the certificates that are offered.

- Lean Manufacturing (12 credits) (CIP# 0615061302)
- Technology Support Specialist (18 credits) (CIP# 0615000007)
- Mechatronics (30 credits) (CIP# 0615000013)

Start Right

Degree-seeking students enrolling at Valencia for the first time will have a limited range of courses from which to choose for their first 18 college-level credits. Within the first 18 college credit hours, you will be required to take ENC1101 (3 credits), and if applicable, SLS 1122 (3 credits) and a mathematics course appropriate to your selected meta-major (3 credits). The remaining courses will be chosen from the General Education Core Courses in humanities (3 credits), science (3 credits), or social science (3 credits), and/or the introductory courses within the A.S. degree programs. For specific courses see the *Foundation Courses* on the "Program Requirements" tab. For course sequencing recommendations, see your Career Program Advisor or create an education plan by logging into Atlas, clicking on the LifeMap tab and clicking My Education Plan.

Potential Careers

- Industrial Technician
- Automation Technician
- Maintenance Technician
- Mechanic
- Machinery Maintenance Worker
- Millwright
- Supply Chain Automation Technician

Salary & Earnings Information

For career information related to this program, please visit **O*Net OnLine**.

Contacts

Future Students

To learn more about this program, contact Enrollment Services at enrollment@valenciacollege.edu or 407-582-1507 or visit <https://valenciacollege.edu/engineering> (<https://valenciacollege.edu/engineering/>)

Current Students

Your Career Program Advisor contact information can be found in Atlas. Log into Atlas, click on the Courses tab, and check your Academic Profile information to find a link to your Advisor.

Osceola Campus Faculty Program Chair

Ana Tenorio-Sandoval:
atenoriosandoval@ValenciaCollege.edu
407-582-7439

Internship and Workforce Services

If you need assistance with job resources or in locating an internship, please visit: valenciacollege.edu/internship (<https://valenciacollege.edu/internship/>)

Program Outcomes

1. Apply basic mathematical and engineering concepts to technical problem solving appropriate to the discipline;

- Demonstrate proficiency in print reading and interpreting industrial diagrams and blueprints;
- Conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;
- Understand, operate, troubleshoot, and maintain electrical, pneumatic, hydraulic, and electromechanical components and/or systems;
- Demonstrate strategies and technologies used to collect, analyze, record, and share information in manufacturing and supply chain automation;
- Apply written, oral, and graphical communication effectively in both technical and non-technical environments; and an ability to identify and use appropriate technical literature.

Program Requirements

Foundation Courses

| | | |
|----------------|---------------------------------------|---|
| ENC 1101 | FRESHMAN COMPOSITION I ^{++~} | 3 |
| Humanities | See Gen. Ed. Core requirement ~ | 3 |
| Mathematics | See Gen. Ed. Core requirement ~ | 3 |
| Science | See Gen. Ed. Core requirement ~ | 3 |
| Social Science | POS 2041 or AMH 2020 ~ | 3 |

Intermediate Courses

| | | |
|-----------|---|---|
| MTB 2321C | TECHNICAL MATH | 3 |
| EET 1084C | FUNDAMENTALS OF ELECTRONICS | 3 |
| ETI 1110 | INTRODUCTION TO QUALITY ASSURANCE | 3 |
| ETI 1701 | INDUSTRIAL SAFETY | 3 |
| ETI 2420 | MANUFACTURING MATERIALS AND PROCESSES | 3 |
| ETM 2010C | MECHANICAL MEASUREMENT AND INSTRUMENTATION | 3 |
| ETM 2315C | HYDRAULICS AND PNEUMATICS * | 3 |
| ETI 2644 | PRODUCTION AND INVENTORY CONTROL | 3 |
| ETS 2535 | AUTOMATED PROCESS CONTROL * | 3 |
| ETI 2542C | INDUSTRY 4.0 AND AUTOMATION CONTROL WITH PLCs * | 3 |

Advanced Courses

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|--|--|----|
| See Advanced Specialization Courses Listed Below | | 15 |
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Total Credit Hours **60**

Advanced Manufacturing Specialization

Program Outcomes

- Assist in the design, operation, and troubleshooting of Advanced Manufacturing systems.
- Identify lean and six sigma concepts in manufacturing environments.
- Operate and troubleshoot industrial automation systems.

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| ETD 1103C | ENGINEERING GRAPHICS WITH CAD | 3 |
| ETI 1622 | CONCEPTS OF LEAN MANUFACTURING AND SIX SIGMA * | 3 |
| ETS 2511C | ELECTROMECHANICAL SYSTEMS * | 3 |
| Electives | See Selected Engineering Technology Electives Listed Below | 6 |

Total Credit Hours **15**

Supply Chain Automation Specialization

Program Outcomes

- Demonstrate proficiency in automated warehousing and materials handling;
- Demonstrate an understanding of machine fundamentals, components, maintenance, and mechanical troubleshooting;
- Demonstrate proficiency in troubleshooting of Automated Controls Systems.

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| ETI 1151C | PRINT READING FOR TRADES | 3 |
| ETI 1486C | INTRODUCTION TO AUTOMATED WAREHOUSING | 3 |
| ETI 2501C | MECHANICS AND MECHANICAL SYSTEMS * | 3 |
| ETI 2843C | MOTORS AND CONTROLS * | 3 |
| Electives | See Selected Engineering Technology Electives Listed Below | 3 |

Total Credit Hours **15**

Selected Engineering Technology Electives

| | | |
|-----------|---|---|
| ETI 2401C | MACHINING FUNDAMENTALS * | 3 |
| ETI 2408C | SURVEY OF WELDING * | 3 |
| ETS 2531C | HUMAN MACHINE INTERFACES | 3 |
| ETS 1603C | FUNDAMENTALS OF ROBOTICS AND SIMULATION * | 3 |
| ETM 1600C | AUTOMATION AND CONTROLS FUNDAMENTALS | 3 |
| ETS 2210C | PRINCIPLES OF PHOTONICS | 3 |
| ETS 2544C | ADVANCED PROGRAMMABLE LOGIC CONTROLLERS | 3 |
| ETS 2604C | ROBOTICS APPLICATIONS * | 3 |
| CET 2486C | LOCAL AREA NETWORKS | 3 |

Any ETI, ETS, ETM course you meet the pre-requisite for, which is not already part of your degree requirement.

+ This course must be completed with a grade of C or better.

* This course has a prerequisite; check description in Valencia catalog.

~ This course is a general education course.

Engineering Technology Support Specialist Technical Certificate

This certificate program is comprised of the core curriculum of the Engineering Technology AS degree program (1615000001). Credits earned toward this certificate can be applied to the degree.

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (State of Florida Administrative Code (F.A.C.) Rule 6A-14.030).

This program focuses on broad, transferable skills, acquisition of information, and demonstration of the following elements of the Engineering Technology Program: production materials and processes,

quality production, computer aided drafting, electricity and electronics, mechanics, instrumentation, and safety.

The certificate program technical skills standards align with those of the Manufacturing Skills Standards Council (MSSC) and prepares the student for the MSSC Certified Production Technician (CPT) certification and entry-level technical jobs in high-tech production, manufacturing, distribution, and engineering research and development facilities.

Program Outcomes

Upon successful completion of the program, the student is able to:

1. Apply concepts related to electricity and electronics.
2. Demonstrate proficiently in the use of quality-assurance methods and quality-control concepts.
3. Incorporate industrial safety, health, and environmental requirements.
4. Demonstrate proficiency in using tools, instruments, testing devices, and basic troubleshooting skills.
5. Demonstrate an understanding of industrial processes and material properties.
6. Generate and interpret computer-aided drawings.
7. Incorporate modern business practices and strategies.

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| EET 1084C | FUNDAMENTALS OF ELECTRONICS | 3 |
| ETI 1110 | INTRODUCTION TO QUALITY ASSURANCE | 3 |
| ETI 1701 | INDUSTRIAL SAFETY | 3 |
| ETI 1151C or ETD 1103C | PRINT READING FOR TRADES ENGINEERING GRAPHICS WITH CAD | 3 |
| ETM 2010C | MECHANICAL MEASUREMENT AND INSTRUMENTATION | 3 |
| ETI 2542C | INDUSTRY 4.0 AND AUTOMATION CONTROL WITH PLCS * | 3 |
| Total Credit Hours | | 18 |

* This course has a prerequisite; check description in Valencia catalog.

Lean Manufacturing Technical Certificate

This certificate program is comprised of the core curriculum of the Engineering Technology AS degree program (1615000001). Credits earned toward this certificate can be applied to the degree.

Students who complete this certificate will be able to demonstrate proficiency in the use of quality assurance methods, quality control concepts, identify lean and six sigma concepts in manufacturing environments, and identify, implement and/or interpret supply chain and operations management concepts and techniques.

Program Outcomes

Upon successful completion of this program, the student is able to:

1. Demonstrate proficiency in the use of quality assurance methods, quality control concepts
2. Identify lean and six sigma concepts in manufacturing environments.
3. Identify, implement and/or interpret supply chain and operations management concepts and techniques.

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| ETI 1110 | INTRODUCTION TO QUALITY ASSURANCE | 3 |
| ETI 1622 | CONCEPTS OF LEAN MANUFACTURING AND SIX SIGMA * | 3 |

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|-----------|--|---|
| ETI 2644 | PRODUCTION AND INVENTORY CONTROL | 3 |
| ETM 2010C | MECHANICAL MEASUREMENT AND INSTRUMENTATION | 3 |

Total Credit Hours 12

* This course has a prerequisite; check description in Valencia catalog.

Mechatronics Technical Certificate

This certificate program is part of the Engineering Technology AS degree program (1615000001) under the Advanced Manufacturing specialization.

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Manufacturing career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Manufacturing career cluster.

Additionally, this advanced certificate program in-depth technical skills standards align with those of the Manufacturing Skills Standards Council (MSSC) and prepares the student for the MSSC Certified Production Technician (CPT) and MSSC Certified Technician-Supply Chain Automation (CT-SCA)[™] program in which prepares technicians to install, operate, support, upgrade, and maintain the automated material handling equipment and systems which support the industrial supply chain automation systems and entry-level technical jobs in high-tech production, manufacturing, distribution, and engineering research and development facilities.

Program Outcomes

Upon successful completion of the program, the student is able to:

1. Demonstrate an understanding of industrial processes and material properties.
2. Generate and interpret computer-aided drawings.
3. Apply concepts related to electricity and electronics.
4. Incorporate industrial safety, health, and environmental requirements.
5. Demonstrate proficiency in using tools, instruments, testing devices, and basic troubleshooting skills.
6. Operate, troubleshoot, and maintain pneumatic, hydraulic, and electromechanical components and systems.
7. Operate and troubleshoot industrial automation systems.
8. Apply the principles of robotics to automated systems.

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|---------------------------|---|---|
| EET 1084C | FUNDAMENTALS OF ELECTRONICS | 3 |
| ETI 1151C or ETD 1103C | PRINT READING FOR TRADES ENGINEERING GRAPHICS WITH CAD | 3 |
| ETI 1701 | INDUSTRIAL SAFETY | 3 |
| ETI 2420 | MANUFACTURING MATERIALS AND PROCESSES | 3 |
| ETI 2501C | MECHANICS AND MECHANICAL SYSTEMS * | 3 |
| ETI 2542C | INDUSTRY 4.0 AND AUTOMATION CONTROL WITH PLCS * | 3 |

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| ETI 2843C | MOTORS AND CONTROLS * | 3 |
| ETM 2010C | MECHANICAL MEASUREMENT AND INSTRUMENTATION | 3 |
| ETM 2315C | HYDRAULICS AND PNEUMATICS * | 3 |
| ETS 2535 | AUTOMATED PROCESS CONTROL * | 3 |
| Total Credit Hours | | 30 |

* This course has a prerequisite; check description in Valencia catalog.