



The National Advanced Materials and
Manufacturing Innovation Institute

IGNITE: Mastering Manufacturing

29 April 2025

*LIFT is operated by the American Lightweight Materials Manufacturing Innovation
Institute (ALMMII), a Detroit-based nonprofit public-private partnership*



Rev. 1-1-25

What is LIFT?



Driving American Advanced Manufacturing Into the Future Through Technology and Talent Development

LIFT is an accelerator convening and connecting government, industry and academia in the fields of **advanced materials, manufacturing processes, systems engineering and talent development** to enhance America's manufacturing competitiveness, national economy and national security.



Nonprofit 501(c)3 | Public-Private Partnership | Member Based

Learning Innovations For Tomorrow



A 3-year foundational high school curriculum to develop the “multi-skilled technician” needed in today’s workplace

- Year 1: Materials Science and Introduction to Manufacturing
- Years 2 & 3: Advanced Manufacturing Systems 1 & 2

37,000+
Students have taken at least one IGNITE course



An innovative credentialing program for active-duty servicemembers, veterans, National Guard and Reservists, spouses and civilians, in nationally portable, industry-recognized and high-demand manufacturing fields.

- CNC Machining
- Welding
- Robotics
- Industrial Technology Maintenance



1,000+
enrolled learners across the country



A state-of-the-art interactive learning facility, located in the LIFT Detroit facility, the LIFT Learning Lab features six unique labs to prepare students for the most in-demand manufacturing careers.

- Smart Factory Twin Lab
- Fundamental Skills Development Lab
- LIFT Virtual Learning Lab
- Materials Science & Project Fabrication Lab
- Welding Technician Training Center
- CNC Operations Training Center

5,500+
Students reached in last 12 months

Partners in Developing the IGNITE Curriculum

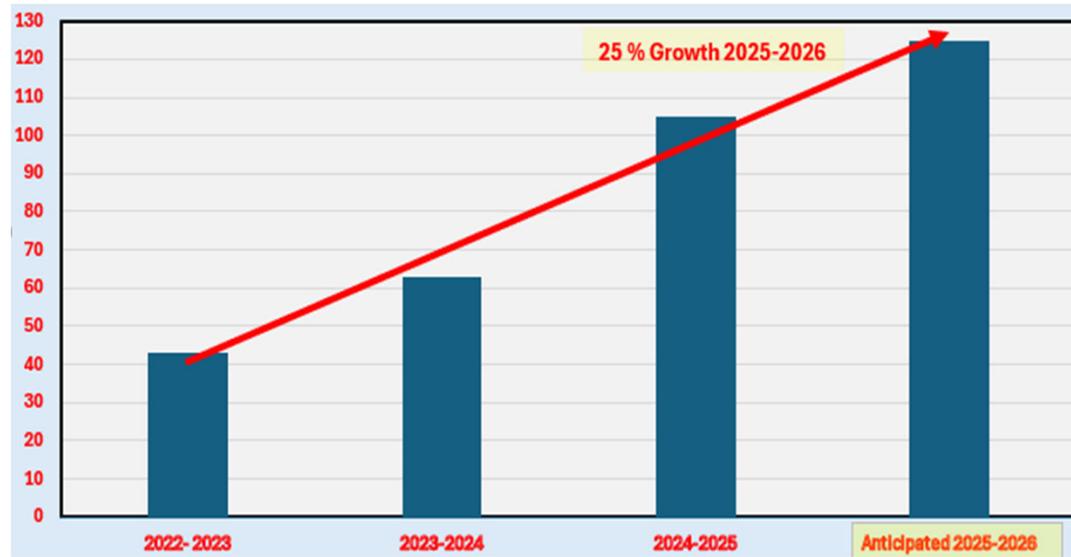


Growth of IGNITE Across the Nation

IGNITE Curriculum Program Concentration Map



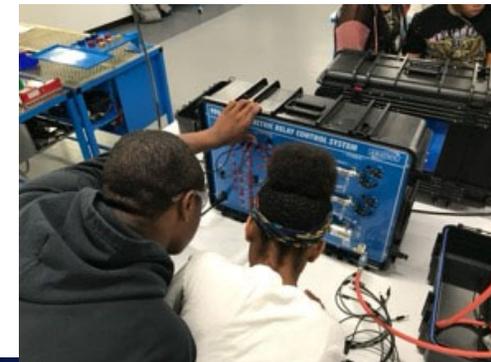
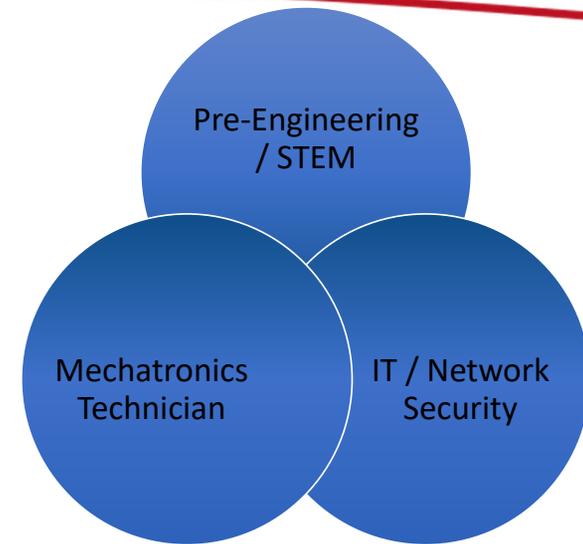
Number of IGNITE Programs



IGNITE Goals

IGNITE: Mastering Manufacturing Program

- ▶ Blends career exploration with career preparation
- ▶ Project Based Learning
- ▶ 6 Semester Long Courses
- ▶ High School grades 9-12
- ▶ Program Themes: Industry 4.0, Design and Advanced Materials/Processes



IGNITE Regional Amatrol Training Center

LIFT personnel provides IGNITE teacher training at LIFT Detroit

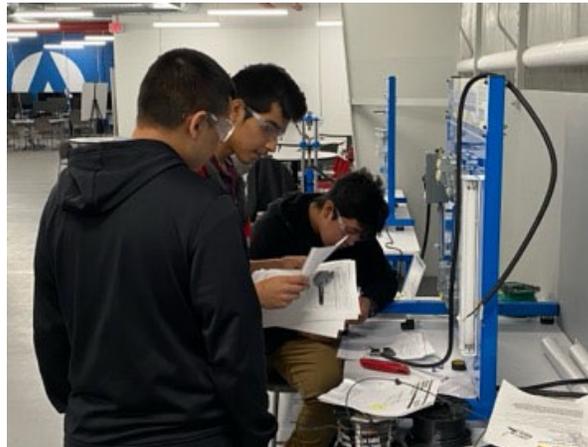
- ▶ LIFT personnel provides IGNITE teacher training at LIFT Detroit in June 2024
- ▶ LIFT personnel led instructors from Liberty High School in Kissimmee, FL and West High School in Waterloo, IA for a weeklong training on using Amatrol IGNITE program.
- ▶ Topics of instruction included: CAD/Additive Manufacturing, Machine Automation, AC/DC Electricity, Pneumatics, Electrical Relay Control, Robot Programming, Safety with OSHA-10 Option, Measurement Tools, Print Reading, CNC Programming, Skill Boss Tasks, and Project Based Learning.



Career Exploration

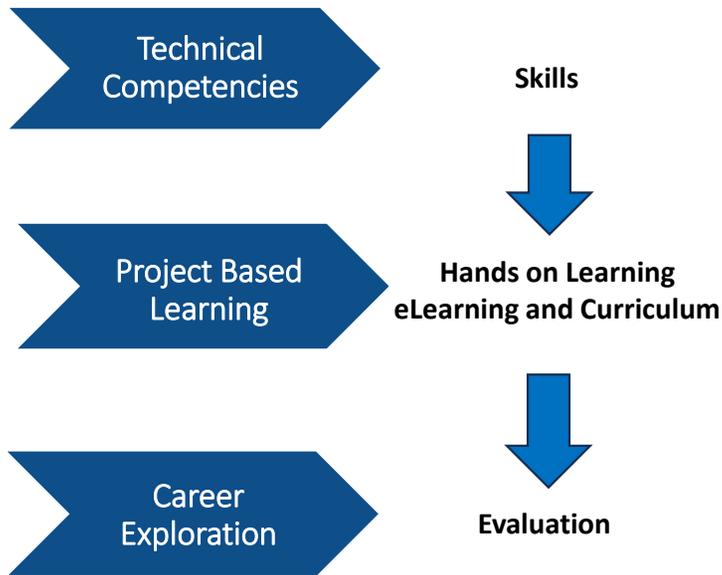
Career Pathways:

- Advanced Manufacturing
- Automation / Robotics
- Industrial Design
- IT / Network Security
- Industrial Maintenance
- Systems Integration
- CNC Machining
- Data Analytics
- Engineering
- Processes / Lean / Safety
- Material Science



IGNITE Course Structure

Approx. 65 Hours Each and Blend of Online and Hands-On Training



Course 1 – Introduction to Advanced Mfg.

1. Fastest Most Accurate Material Handling System
2. Bagel Dough Mixing Machine
3. Easyrider Computer Workstation
4. Pizza Oven Door
5. Couch Potato Paradise
6. Stealth Toy Design
7. Make A Statement With Logos
8. Mini Project – Intro to Materials Science

Course 2 - Introduction to Systems

1. Baking Me Crazy
2. Pancake Maker Unloading Robot
3. Palooza Recycling
4. Pixel Art Character

Course 3 - Mechatronics Systems

1. Can you Hear the Music
2. Look no Brakes
3. Bring in the Snow
4. Who Moved the Water
5. Piston w/o Redstone Clock Activation
6. I want it now; Supply Chain System

Course 4 - Digital Mfg. Systems

1. Blocks w/ Electronic Sensors
2. CAM LOGO Challenge:
3. Danger, Danger, Sound The Alarm!
4. A Family That Fishes Together, Stays Together
5. Fishing Bait Company Improves Quality
6. Clamp, Drill, Unclamp Repeat
7. Z-Axis, X-Axis, But WHY
8. Ups And Downs

Team Projects

Course 5 - Advanced Materials / Design

Course 6 - IIoT, Data Analytics / Networking

Smart Automation Certification Alliance

SACA Certification: Developed by industry For Industry



Mission: Smart Automation Certification Alliance (SACA): develop and deploy modular Industry 4.0 certifications for a wide range of industries

Vision: Provide Highly Affordable ACCESSIBLE certifications that significantly increase the number of individuals who possess the skills represented by these credentials ensuring that companies have highly skilled workers in an Industry 4.0 world

Associate:

C-101 Industry 4.0 Associate-Basic Operations

C-102 Industry 4.0 Associate-Advanced Operations

C-104 Associate Smart Factory Systems 1

Specialist:

C-201 Electrical Systems 1

C-205 Sensor Logic Systems 1

C-207 Programmable Controller Systems 1

C-208 Programmable Controller Troubleshooting 1

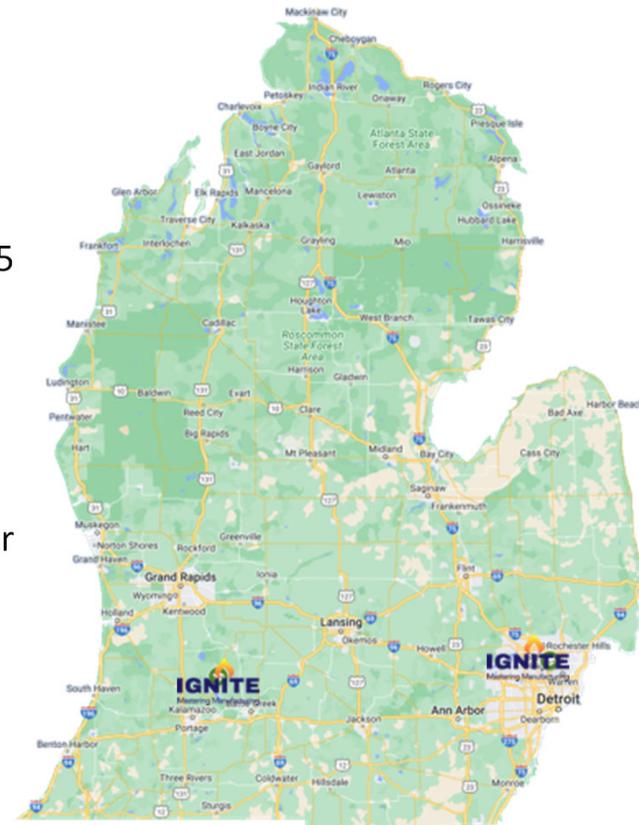
C-209 Pneumatic Systems 1

C-212 Ethernet Communications 1

FY24 Budget IGNITE Pilot Schools in Michigan

Program Updates:

- ▶ IGNITE: Mastering Manufacturing equipment expected delivery Q2 2025
- ▶ Troy Athens and Delton Kellogg visit to LIFT, Q4 2024
- ▶ Site visit Troy Athens HS, Jan. 2025
- ▶ Site visit to Delton Kellogg, Feb. 2025
- ▶ Athens and Kellogg currently recruiting students for 2025-26 school year



Delton Kellogg Facility Upgrades



Thank You!



Thank You

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