

## Essential Skills

# Building Path – Science, Technology, Engineering & Math

This path involves performing engineering duties like planning and designing tools, engines, machines, and other mechanically functioning equipment. Other jobs include overseeing installation, operation, maintenance, and repair of equipment.

## Building Path – Science, Technology, Engineering & Math Program at Great Oaks

Program	Location
Engineering Technologies & Robotics	Scarlet

## Frequently Used Pathway Skills/Abilities

Each career path has a specific set of skills/abilities that employees need for success in the industry. It is recommended that students have, are developing or can develop the skills/abilities listed below.

Sharpness of vision/hearing acuity	<ul style="list-style-type: none"><li>• Distinguish details/differences visually</li><li>• Differentiate various sounds</li><li>• Perceive distance/depth of objects in space</li><li>• Distinguish between colors (blueprints/wiring diagrams)</li></ul>
Communication	<ul style="list-style-type: none"><li>• Express/explain thoughts/ideas</li><li>• Observe/document/maintain/update accurate records</li><li>• Listen/relay accurate information in written/verbal manner</li><li>• Use active listening to give full attention/understanding to others</li><li>• Able to read/understand blueprints/construction documents</li><li>• Social communication (appropriate social media/workplace conversations)</li></ul>
Physical mobility/strength Eye-hand coordination/dexterity	<ul style="list-style-type: none"><li>• Ability to sit for extended times using a computer</li><li>• Use arm/eye-hand coordination/manual dexterity to grasp/manipulate/assemble items</li><li>• Ability to use power/hand tools</li><li>• Work with precision tools/equipment</li></ul>
Problem-solving/reasoning	<ul style="list-style-type: none"><li>• Follow sequenced activities accurately</li><li>• Work independently with minimal supervision</li><li>• Apply general rules to specific problems</li><li>• Develop/follow procedures and processes</li><li>• Make informed decisions quickly</li><li>• Study specifications to prepare project layout/work activities</li></ul>

## Technology and Software

All career & technical education programs utilize various software and industry-specific equipment to prepare students for careers. Students will independently access and use various online resources, technology, and equipment.

Here is an overview of key online and computer technology used in this pathway:

Vendor	Software/Learning Management System
SolidWorks	3D CAD Design Software
Tooling University	Tooling U Advanced
CareerSafe	Online OSHA 10 credentialing preparation/testing platform
Rockwell Automation	Manufacturing/automation software
Microsoft Office	Word, PowerPoint, Excel and Outlook
Internet Browsing	Conduct career-related independent and group research

## Industry Credentials/Certifications

Credentials/certifications demonstrate knowledge and skills. They are typically earned by successfully completing an exam or completing a training program. Exams are developed by industry professionals, not high school educators, and are used to verify that students have the skills needed for work.

Students can earn industry credentials/certifications while at Great Oaks. Accommodations are available but are subject to vendor or State of Ohio approval. Typical accommodations for industry-related credentials/certifications include:

Extended time

Read-aloud/translation services

## Post-secondary

Great Oaks offers college credit courses in both academic and career technical programs.

College Credit Plus (CCP) • The CCP program provides Ohio high school students an opportunity to complete college courses and earn transcribed credit.

Career Technical Assurance Guides (CTAGs) • CTAGs award college credit for career-technical coursework to students who complete an approved course and earn a qualifying score on the end of course exam.

Articulated Credit • Some Great Oaks career-technical programs have agreements with colleges where students can earn credit toward a specific degree.

## Additional Pathway Considerations

Some career pathways have additional standards students must meet to fully participate in Great Oaks programs. Programs in this pathway have some of the following requirements to participate in learning experiences and earn industry credentials/certifications.

Academic strengths

- Math/numerical calculations (multi-step calculations/unit conversions/decimals)
- Geometry/spatial awareness
- Oral/written communication

Safety

- Some work sites require OSHA 10 certification
- Some sites require passing a drug screen
- Awareness of workplace hazards (electrical/equipment/tools/power delivery systems)
- Wear personal protective equipment (safety glasses, hardhats, gloves, safety harnesses, steel-toed boots/hearing protection)
- Read/follow instruction/technical manuals
- Understand hazards associated with equipment/tools/worksites
- Follow policies/procedures/codes to protect people/data/property
- Remain aware of surroundings such as live electrical points/overhead dangers/gas lines/underground utilities/falling objects

Career expectations

- Install/calibrate/operate robotic systems
- Record information (time/materials used/data)
- Integrate robotics with peripheral equipment (controllers/3D printers)
- Install/calibrate/operate/maintain robotic equipment
- Troubleshoot mechanical failures/maintenance issues
- Understand/use continuous improvement manufacturing processes (Lean)
- Program/debug robotic equipment
- Research feasibility/design/operation of robotic equipment
- Study/read blueprints/sketches/plans for project layout
- Understand/use materials specified in blueprints/plans
- Work collaboratively with experts across various pathways