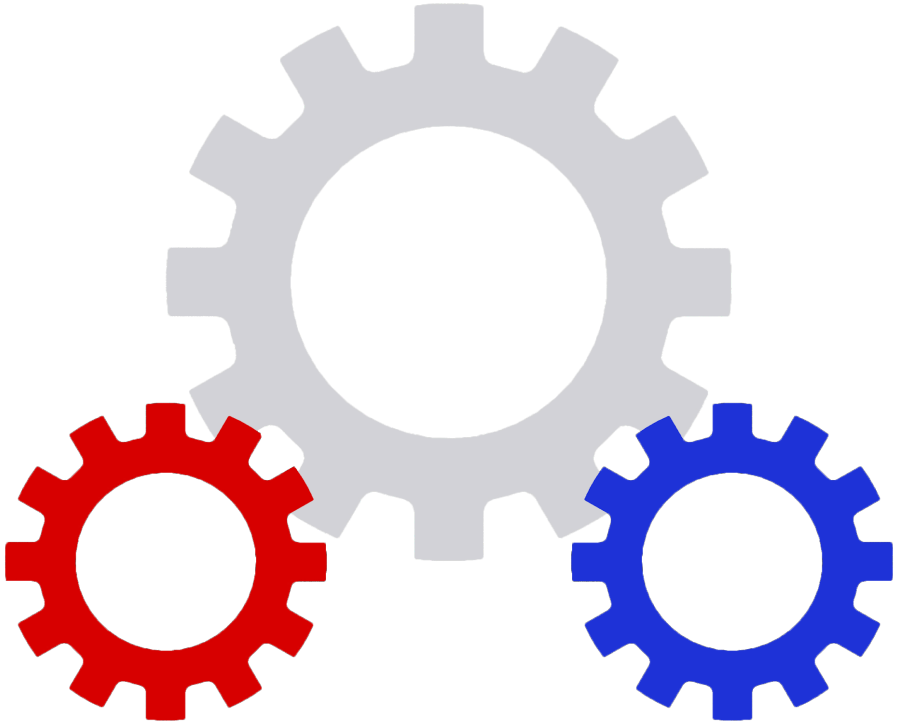
The WorBots 4145

Basic Tool Certification (BTC)



Cultivating a Culture of STEM in Worthington, Ohio

ENGAGE, INSPIRE, IMPACT

Introduction

The **WorBots Basic Tool Certification (BTC)** is a foundational safety and skills certification designed to ensure that all FRC team members are proficient in using essential tools in the workshop. This certification program focuses on the correct handling, maintenance, and safety practices associated with a variety of basic tools, such as screwdrivers, dial calipers, X-Acto knives, wrenches, and measuring instruments.

Why BTC is Important

- **Safety First:** Proper tool usage minimizes the risk of accidents, injuries, and damages, creating a safer environment for everyone in the workshop.
- **Skill Development:** BTC ensures that every team member acquires essential technical skills, which are foundational for more advanced tasks in robotics.
- **Efficiency and Precision:** A strong understanding of tool usage allows students to work more efficiently and accurately, improving the quality of their work.
- **Responsibility and Independence:** Certification empowers students to work independently and responsibly, allowing them to contribute more effectively to the team's projects.

Shop Access and Restrictions

The **WorBots Basic Tool Certification (BTC)** is a mandatory requirement for any student wishing to participate in hands-on work within the shop. Without this certification, students are strictly prohibited from using any tools or operating equipment. This restriction ensures that only those who have demonstrated proper tool handling and safety knowledge are granted access to work with tools.

Why This Policy is Essential

- **Safety Assurance:** Allowing only certified students to use tools significantly reduces the risk of accidents, protecting both the individual and their teammates from potential hazards.
- **Accountability:** This policy reinforces responsibility, as each student must commit to learning and respecting shop safety protocols before participating in any physical tasks.
- **Confidence and Competence:** Certified students gain confidence in their skills, allowing them to work more effectively. Knowing that every teammate is certified creates a reliable and safe working environment for all.

Certification Completion

Upon successfully completing the training session, students will receive their **WorBots Basic Tool Certification (BTC)**, which authorizes them to work with all listed tools independently in the workshop. This comprehensive approach ensures that students are well-prepared to contribute to the team's larger robotics projects with confidence and skill.

WorBots Shop Safety

All shop safety rules must be followed at all times:

Personal Protective Equipment (PPE):

- ☼ Safety Goggles: Must be worn at all times when using tools or if machines are running nearby.
- ☼ Closed-Toed Shoes: Required in the workshop to protect feet from heavy or sharp objects.
- ☼ Appropriate Clothing: Wear clothing that provides adequate protection, avoiding loose items.
- ☼ Long Hair Tied Back: To prevent it from getting caught in machines or tools.

General Workshop Behavior:

- ☼ No Running: Avoid running to prevent accidents or collisions in the workshop.
- ☼ Stay Alert: Be mindful and attentive to surroundings, especially when machines are in use.

Certification and Training:

- ☼ Safety Certification: Only use tools or machines after completing the required safety training and certification.

Workspace Maintenance:

- ☼ Clean Workspace Regularly: Ensure the workspace is organized and free from clutter.
- ☼ Put Away Tools: Store all tools properly after use to prevent tripping hazards and maintain organization.
- ☼ Unplug Power Tools: Disconnect tools when not in use to prevent accidental activation.
- ☼ Sweep Workbench/Floor: Clean all surfaces after work to remove debris and hazards.

Accident Protocol

- ☼ Report Accidents Immediately: Notify the coaches of any accidents or injuries right away.
- ☼ Address Medical Issues Promptly: Seek first aid or medical attention as needed.

Measurement and Marking Tools

Tool Name	Function
Dial Calipers	for precise measurements of components
Tape Measure	to measure larger distances and components
Rulers	for quick, straightforward measurements
Adjustable Square	to check 90-degree angles and make precise marks
Marking Scribe	to mark cutting lines on metal or plastic
Center Punch	for marking drill spots on metal
Protractor	for measuring angles
Levels	to ensure parts are aligned and level

Cutting and Shaping Tools

Tool Name	Function
Utility Knives	for general-purpose cutting tasks
X-Acto Knives	for precision cutting, especially in prototyping
Hacksaw	for cutting metal and plastic by hand
Metal Files	for smoothing edges and shaping materials
Deburring Tool	to remove sharp edges on metal parts
Scissors	for cutting materials like fabric, paper, or tape.

Fastening and Assembly Tools

Tool Name	Function
Screwdrivers	(Phillips and Flathead) for fastening screws
Hex drivers	(Allen Wrenches) for fastening of machine screws
Wrenches	(Adjustable, Box, and Open-End) for tightening and loosening nuts and bolts
Nut Drivers	for tightening nuts without a wrench
Pliers	(Needle-Nose and Slip-Joint) for gripping and manipulating materials

Clamping and Holding Tools

Tool Name	Function
C-Clamps	to hold materials in place while working on them
Spring Clamps	for quickly securing lighter materials
Vise Grips	adjustable locking pliers for strong grip
Bench Vise	for holding larger pieces steady while working

Alignment and Adjustment Tools

Tool Name	Function
Mallet	for gentle adjustments and alignments
Ball-Peen Hammer	for shaping metal and riveting

Electrical Shop Tools

Tool Name	Function
Wire Strippers	for removing insulation from wires
Crimping Tool	for crimping wire terminals