

Week 1: Safety and Shop Orientation

- Introduction to metal shop safety protocols, including the proper use of personal protective equipment (PPE) such as safety glasses, gloves, and ear protection.
- Familiarization with the layout of the metal shop, including emergency exits, fire extinguishers, and first aid stations.
- Identification of potential hazards in the metal shop environment and learning how to mitigate risks.

Week 2: Introduction to Hand Tools

- Overview of essential hand tools used in metalworking, including files, hacksaws, wrenches, pliers, and hammers.
- Hands-on practice with each hand tool to develop proficiency and understanding of their functions.
- Instruction on proper tool handling techniques and safe usage practices.

Week 3: Measuring and Marking

- Instruction on measurement tools used in metalworking, including tape measures, calipers, squares, and rulers.
- Practice sessions on accurate measurement and marking techniques for layout and fabrication.
- Emphasis on precision and accuracy in measurement to ensure quality workmanship.

Week 4: Cutting and Grinding Techniques

- Introduction to cutting and grinding tools used in metalworking, including angle grinders, cutoff wheels, and band saws.
- Hands-on demonstration of cutting techniques for various metal materials, including steel, aluminum, and copper.
- Practice sessions to develop proficiency in cutting straight lines, curves, and angles.

Week 5: Welding Fundamentals (Part 1)

- Overview of welding processes commonly used in metalworking, including stick welding, MIG welding, and TIG welding.
- Introduction to welding safety precautions and equipment setup.
- Hands-on practice with basic welding techniques, focusing on creating strong and clean welds.

Week 6: Welding Fundamentals (Part 2)

- Continued instruction on welding techniques, including welding positions, electrode selection, and troubleshooting common welding problems.

- Practice sessions to further develop welding skills and proficiency under the guidance of instructors.

Week 7: Metal Forming and Shaping

- Introduction to metal forming techniques such as bending, rolling, and punching.
- Hands-on practice with metal forming tools and equipment, including brakes, rollers, and punches.
- Application of metal forming techniques to create simple shapes and components.

Week 8: Machining Basics

- Overview of basic machining processes used in metalworking, including milling, drilling, and turning.
- Introduction to metalworking machinery such as milling machines, drill presses, and lathes.
- Hands-on practice with machining techniques to produce accurate and precise metal components.

Week 9: Advanced Fabrication Techniques

- Exploration of advanced fabrication techniques such as welding fabrication, sheet metal fabrication, and CNC machining.
- Instruction on reading and interpreting technical drawings and blueprints for fabrication projects.
- Hands-on fabrication projects to apply learned techniques and skills.

Week 10: Finishing and Surface Treatment

- Introduction to metal finishing techniques, including grinding, sanding, polishing, and painting.
- Instruction on surface preparation and treatment methods to achieve desired finishes.
- Hands-on practice with finishing techniques to enhance the appearance and durability of metalwork.

Week 11-12: Final Project

- *Revise project to incorporate a NIMS-style performance assessment part, machined to exact tolerances.*
- *Emphasize accuracy, measurement verification, and quality control practices.*
- Participants will work individually or in groups to design and fabricate a final project of their choice, incorporating skills and techniques learned throughout the program.
- Emphasis will be placed on creativity, craftsmanship, and problem-solving in the completion of the final project.
- Instructors will provide guidance and support as needed, including assistance with project planning, fabrication methods, and finishing techniques.