



## COURSE OUTLINE

### INTRODUCTION

The Metalwork 11 course meets the general aims of the Technology Education curriculum.

[https://curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/pdf/10-12/adst/en\\_adst\\_11\\_met.pdf](https://curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/pdf/10-12/adst/en_adst_11_met.pdf)

### BIG IDEAS AND GENERAL LEARNING OUTCOMES

Design for the life cycle includes consideration of social and environmental impacts

Personal design interests require the evaluation and refinement of skills

Tools and technologies can be adapted for specific purposes

**Understanding context:** Conduct **user-centred research** to understand design opportunities and barriers

**Defining:** Choose a design opportunity and point of view. Identify potential users, intended impact, and possible unintended negative consequences. Make inferences about premises and boundaries that define the design space

**Ideating:** Take creative risks to identify gaps to explore as design space. Generate ideas to create a range of possibilities and add to others' ideas in ways that create additional possibilities. Critically analyze how competing social, ethical, and sustainability considerations impact designed solutions to meet global needs for preferred futures. Prioritize ideas for prototyping and **designing with users**

**Prototyping:** Identify and use a variety of **sources of inspiration** and **information**. Choose an appropriate form, scale, and level of detail for prototyping, and plan procedures for prototyping multiple ideas. Analyze the **design for life cycle**. Construct prototypes, making changes to tools, materials, and procedures as needed

**Testing:** Identify feedback most needed and possible **sources of that feedback**. Develop an **appropriate test** of prototypes. Gather feedback from users over time to critically evaluate their design and make changes to products designs or processes. Iterate the prototype or abandon the design idea.

**Making:** Identify appropriate tools, technologies, materials, processes, **potential funding sources**, and time needed for production, and where/how these could be available. Use project management processes when working individually or collaboratively to coordinate production

**Sharing:** **Share** their progress while making: to increase feedback, collaboration, and, if applicable, marketing. Decide on how and with whom to share or promote their **product**, creativity, and, if applicable, intellectual property. Critically evaluate their design thinking and processes, and their ability to work effectively both as individuals and collaboratively in a group, including the ability to implement project management processes. Identify new design issues, including how they or others might build on their concept.

**Applied Skills:** Demonstrate an awareness of safety issues for themselves, co-workers, and users in both physical and digital environments. Identify and evaluate their skills and skill levels, in relation to their project or design interests, and develop specific plans to learn or refine their skills over time.

**Applied Technologies:** Explore existing new, and emerging tools, **technologies**, and systems and evaluate their suitability for their design interests. Analyze the role and impact of technologies in societal change, and the personal, social, and environmental impacts, including unintended negative consequences, of their choices of technology use. Analyze how cultural beliefs, values, and ethical positions affect the development and use of technologies

### COURSE CONTENT: REQUIRED LEARNING OUTCOMES

1. **Project Development:** Use of Orthographic and Pictorial Drawings. Reading tables and charts for tolerances of machining. Use Measuring Instruments. Tables and charts for tolerancing and machine theory.

2. **Basic Metallurgy:** Specific knowledge of different types of metals and their properties. This will include Ferrous and non-ferrous metals and their applications. Types of **metals and alloys** and their characteristics.
3. **Range of Uses of Metalwork:** selection of metal type, size, structural shape, and finish for specific applications
4. **Welding:** Basic concepts of Mig, Oxy-Acetylene, Soldering, and Arc welding. Students will demonstrate safe practice and the ability to weld different types of metals and thickness's
5. **Fabrication techniques and processes using hand tools and stationary equipment:** Students will learn and use a variety of non-power tools to form, fit, and make all or part of a project. Stationary equipment includes large, heavy duty, industrial lathes, milling machine, drill press, grinders, presses, polishers, and benders. Student will demonstrate safe procedures for all machines, tools, and devices.
6. **Foundry Processes:** Students will learn how to cast by creating patterns and molds. Students will be responsible for operation of the forge and the high degree of safety involved. Heat Treatment.
7. **Safety and Machine Theory:** General Shop Safety: Safety sense, personal conduct, mindfulness, and responsibility. Specific training to the correct, safe use of power machines and hand tools in the metal shop

## STUDENT LEARNING ACTIVITIES

- Students will participate in general theory lessons, group activities, and individual work.
- Project work will include: Hand Drawing, Computer Aided Design and Model Making

## ASSESSMENT & EVALUATION

1. Theory - 15% - Quizzes, assignments, dedicated notebook.
2. Practical Work - 70% - Projects, design portfolios
3. Social Responsibility 15% clean-up habits, accountability, **student service**

Teacher and Personal Self-Evaluations/Assessments are used to evaluate your ability to work effectively as an individual and collaboratively in a group, including your ability to share and maintain an efficient co-operative work space. You will be expected to reflect on your designs/projects with marking criteria.

## EXPECTATIONS

**Lab Equipment** - Before using equipment, computers, tables you must **be instructed how to use them** appropriately. Any damage caused due to negligence/neglect, or improper use will be **charged to the student**. All books/equipment must remain in the lab.

**Attendance** - This is an APPLIED course, **ATTENDANCE IS MANDATORY**

**Project Completion** - Open shop times are a privilege. It is expected that students who are behind in their work will attend open shop periods.

**\*\* ALL PROJECT WORK MUST BE COMPLETED IN ORDER TO PASS THE COURSE \*\***

**Clean-up** - All students are expected to actively participate in clean-up

**Notebook** - A **notebook** and a **pencil** and an **eraser** must be brought to **every** class

## EQUIPMENT AND MATERIALS


**Projects** All materials and special equipment not covered in the course fee, and materials required for extra credit project work must be paid for by the student. Example: Model kits.

## PARENT/GUARDIAN ACKNOWLEDGEMENT

I have read this course outline. I am aware of the course content, policies, expectations, student activities, evaluation procedures, and approximate costs.

Student Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Parent Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Tutorial Time and Schedule:** 

Tutorial Time is available each day from 8:30 AM – 9:30 AM for those students that require extra time or help to finish projects and coursework. This time can also be used for special setups on tooling as required.

Please Note: Tutorial Time should be pre-arranged with the teacher upon request by either the teacher or the student.