Design and Realisation 1- Wood Technology

(1) Overview: This elective explores the fundamentals of wood technology focusing on developing basic competencies in design and wood working. Students will explore basic woodworking techniques, safety procedures, and the creative aspects of working with wood. Students will also acquire knowledge and skills to sketch ideas and draw in oblique projection

(2) Level:

This elective will be offered over 2 terms in Grade 7.

(3) Competency 1 – To draw simple objects in oblique projection (Term 2a)

Competency 2 - Safety Awareness – Understanding and applying safety measures while working with tools and materials. (Term 2c)

Competency 3 - Use of woodworking tools – Preparation of material, Measuring and marking tools, Saws, Hand planes, chisels, holding tools and bench drills, sanding and applying finish by brushing method. (Term 2d & 3b)

Competency 4 – Properties of wood (Term 2b)

Competency 5 – Construct halving, housing and mortice and tenon joint. (Term 3a)

Competency 6 – Realise a pen holder (Term 2e) and a mobile phone holder (Term 3c).

(4) KEY FOCUS AREAS

- Woodworking Skills and Safety
- Creativity and Problem-Solving in Design

(5) Duration

50 hours (2 terms) over 1 year.

(7) IMPLEMENTATION GUIDELINES

Pre-requisites

Before enrolling in this elective, students should meet the following prerequisites to ensure they are prepared for the course:

1. Basic Measurement and Math Skills
    - Ability to read and use a ruler or measuring tape accurately.
    - Understanding of simple calculations for dimensions and angles.
2. Should be physically fit to work with tools and equipment

1. Tools and Equipment

- Measuring and marking tools – Rulers, measuring tapes, try square, marking knife
- Saws – Tenon saw, coping saws,
- Chisels – Bevel edge chisel , Bench firmer chisel , mortice chisel
- Planes – Jack and smoothing planes, surform plane
- Shaping Tools – Rasps, chisels, sandpaper (various grits)
- Fastening Tools – screwdrivers, bench vice and G-Clamp
- Adhesives & Fasteners – Wood glue, nails, screws
- Claw hammer and wooden mallet
- Bench drilling machine and different bits
- Finishing Tools – Paint brushes, varnish applicators

2. Materials

- Wood Pieces – Softwood (Pine)
- Adhesives – Wood glue for assembling parts
- Fasteners – Small nails or screws for secure joints
- Finishing Materials – Sealer, Paint, varnish, or wood stain for customization

3. Safety Gear

- Protective Eyewear – Safety goggles
- Gloves – To protect hands from splinters
- Dust Masks – For sanding and finishing work
- Aprons or Workshop Coats – To protect clothing

4. Workstation

- Workbenches – For practice the different skills .
- Storage Space – For keeping tools and materials organized
- First Aid Kit – In case of minor injuries

INSTRUCTIONAL RESOURCES

1.Printed and Digital Learning Materials

- Notes – Provide step-by-step guides on techniques, safety, and project execution.
- Activity book & Teacher's Guide – Offer structured activities and exercises.
- Online Tutorials & E-books – Interactive digital content from educational platforms

2. Visual and Multimedia Aids

- Instructional Videos & Demonstrations – YouTube tutorials, skill demonstration videos.
- Diagrams & Infographics
- Posters & Charts – Safety rules, step-by-step guides, and process illustrations.

3. Tools and Equipment (for hands-on learning)

4. Real-Life and Hands-on Learning Resources

- Field Trips & Industry Visits – Observing real-world applications in workshops, factories, and studios.
- Guest Speakers & Mentors – Industry professionals offering insights and guidance.
- Prototype Models & Samples – Examples of finished products for students to study

PROCEDURE FOR IMPLEMENTING THE WOODWORK ELECTIVE

Planning & Preparation

- Define learning objectives (e.g., tool safety, precise measurements, creativity).
- Gather tools, materials, and safety gear; organize the workspace.
- Prepare instructional materials, including step-by-step notes and tool demonstrations.

Introduction to the Project

- Explain the purpose and practical benefits of woodworking.
- Conduct safety training, demonstrate tool use, and reinforce safety guidelines through quizzes or discussions.

Design & Planning

- Guide students in sketching designs and determining dimensions.
- Teach accurate material selection, measurement, and waste minimization.

Cutting, Shaping & Making Joints

- Demonstrate proper cutting techniques and supervise students.

- Instruct on making joints and shaping edges using files and sandpaper.

Assembly & Joining

- Assist students in assembling components using joints, nails, screws, or glue.
- Teach clamping techniques for secure bonding.

Finishing & Decoration

- Guide students in sanding for a smooth finish.
- Allow customization with painting, staining, or varnishing, ensuring proper drying before evaluation.

TEACHER'S TASKS

1. Planning & Preparation

- Develop session plan, weekly plan and lesson plan outlining objectives, competencies, and learning outcomes.
- Gather necessary tools, materials, and safety gear.
- Set up a safe and organized woodworking workspace.

2. Instruction & Demonstration

- Introduce the project, explaining its purpose and expected outcomes.
- Teach safety rules and demonstrate proper use of woodworking tools.
- Show step-by-step procedures for measuring, cutting, joining, assembling, and finishing the projects.

3. Guidance & Supervision

- Monitor students to ensure they follow safety protocols.
- Provide individual assistance and correct errors in technique.
- Encourage problem-solving and creativity while supporting struggling students.

4. Assessment & Feedback

- Evaluate students' work based on accuracy, craftsmanship, and safety adherence.
- Provide constructive feedback on their performance.
- Facilitate a reflection session where students discuss their experiences and learning outcomes.

STUDENT'S TASKS

1. Learning & Preparation

- Listen attentively to the teacher’s instructions and demonstrations.
- Write down notes.

- Understand and follow all safety guidelines when handling tools and materials.

2. Design & Planning

- Design and realise the three different projects.
- Choose appropriate materials and plan the construction process.

3. Execution & Problem-Solving

- Measure and mark wood accurately before cutting.
- Cut, shape, join and sand wood pieces.
- Assemble components using appropriate joining techniques (joint, glue, nails, screws).

4. Finishing & Presentation

- Sand the final product for a smooth finish.
- Paint, stain, or varnish the pen holder to enhance its appearance.
- Present their completed project and reflect on the skills learned.

(9) TRAINING REQUIREMENTS FOR TEACHERS

1. Technical Skills in Woodworking
2. Safety Training
3. Instructional and Pedagogical Skills
4. Classroom and Workshop Management
5. Assess practical skills

(10) EVENTS ACCOMPANYING THE IMPLEMENTATION OF THE ELECTIVE

- **Open Day:**
- A dedicated event for prospective students and parents to learn about the elective, course structure, and benefits.
- Exhibition or Showcase:
- A student-led exhibition where projects, assignments, and research conducted during the elective are displayed for public viewing.

(12) SAFETY MEASURES

- Risk Assessment & Training – Identify hazards and train students on equipment use and emergency procedures.
- Use of PPE – Ensure proper protective gear (gloves, goggles, helmets) for safety.
- Supervision & Emergencies – Monitor activities closely and educate students on first aid and emergency protocols.

- Equipment Safety – Regularly inspect, maintain, and store tools properly to prevent accidents.
- Clear Communication & Hygiene – Enforce safety rules and hygiene standards, especially for hazardous materials.

- Use the designing techniques to create unique and innovative projects in the electrical field.

These cross-curricular connections foster a more holistic learning experience, helping students see how different subjects are interconnected and applied in real-world contexts.

(14) EVALUATION

- Continuous assessment along the implementation of the elective
- Project-based assessment based on the application of students' knowledge and skills during the realization of the three projects . The assessment criteria are

1. Planning and Organization:
   - Assessment Criteria: Evaluate how well students plan and organize their work, including setting realistic goals, defining project scope, and managing time effectively.
   - Indicators: Clear project timeline, identification of resources, and organization of tasks.
2. Problem-Solving and Critical Thinking:
   - Assessment Criteria: Assess how students identify challenges and use logical reasoning or creative solutions to overcome them.
   - Indicators: Innovative solutions to the design brief, creative approaches to design and thoughtful decision-making processes.
3. Technical Skills and Application:
   - Assessment Criteria: Assess how well students demonstrate technical proficiency related to their field .
   - Indicators: Proper use of tools, application of relevant techniques and the quality of the final product.
4. Safety and Compliance:
   - Assessment Criteria: Assess whether students followed safety protocols and adhered to best practices related to the tools, materials, and environments they worked in.
   - Indicators: Proper use of personal protective equipment (PPE), adherence to safety guidelines, and maintenance of a safe working environment.

Student Progress Card for the elective