Stage 5 Industrial Technology 200 hours CORE: TIMBER 1

Context(s)	Industrial Technology Timber	Unit Title	Unit 4- serving board

Year Level	9- 200 hrs	Term	3 & 4	Length	Total: 20 Weeks	Year	2024

SYLLABUS OUTCOMES:

IND5-1 identifies, assesses, applies and manages the risks and WHS issues associated with the use of a range of tools, equipment, materials, processes and technologies
IND5-2 applies design principles in the modification, development and production of projects
IND5-3 identifies, selects and uses a range of hand and machine tools, equipment and processes to produce quality practical projects
IND5-4 selects, justifies and uses a range of relevant and associated materials for specific applications
IND5-5 selects, interprets and applies a range of suitable communication techniques in the development, planning, production and presentation of ideas and projects
IND5-6 identifies and participates in collaborative work practices in the learning environment
IND5-7 applies and transfers skills, processes and materials to a variety of contexts and projects
IND5-8 evaluates products in terms of functional, economic, aesthetic and environmental qualities and quality of construction
IND5-9 describes, analyses and uses a range of current, new and emerging technologies and their various applications
IND5-10 describes, analyses and evaluates the impact of technology on society, the environment and cultural issues locally and globally

Related Life Skills outcomes: INDLS-1, INDLS-2, INDLS-3, INDLS-4, INDLS-5, INDLS-6, INDLS-7, INDLS-8, INDLS-9, ~~INDLS-10~~

Unit Overview:

The Timber focus area provides opportunities for students to develop knowledge, understanding and skills in relation to the timber and associated industries.
The core module develops knowledge and skills in the use of tools, materials and techniques related to timber which are enhanced and further developed through the study of a specialist module.

Practical projects undertaken should reflect the nature of the Timber focus area and provide opportunities for students to develop specific knowledge, understanding and skills related to timber technologies.

Specific Project: The emphasis of the serving board is to extend students general wood skills that were commenced in Semester 1.The serving boa rd project will provide students with the opportunity to use both solid timber, as well as introducing them to a range of higher le vel joints. Additionally, students will investigate the use of different adhesives and finishing products. A project report documents the production of the project, incorporating the use of ICT skills developed in previous units. There will be design constraints placed on the serving board, in which students will have to work within (constraints to be determined by classroom teacher).

ESSENTIAL QUESTIONS:	KEY CONCEPTS: Students will better understand that:
• **What influences a project in terms of design and function.** (Link to driving question: WHAT MAKES A GOOD PROJECT?) • **What links to the timber industry can be made from the processes completed in the classroom**	• The processes required to design and construct a more challenging project. • How to write and complete a design portfolio that follows the construction process • Linking processes used in the classroom to the timber industry

Cross-curriculum Priorities, General Capabilities and Other Learning Across the Curriculum					
		Aboriginal and Torres Strait islander histories and cultures	X		Critical and creative thinking
		Asia and Australia's engagement with Asia			Ethical understanding
X		Sustainability			Intercultural understanding
		Civics and citizenship	X		Literacy
		Difference and diversity	X		Numeracy
X		Work and enterprise	X		Personal and social capability
X		Information and communication technology capability			

SENSE OF THE SACRED											
Awe &	X	Conservation		Family		Human Rights		Peace		Stewardship of	X

Wonder										Creation	
Celebration		Courage	X	Global Solidarity and the Global Connection		Justice		Reconciliation		Structural Change	
Common Good		Cultural Critique		Hope		Love		Sacredness of life		Self Respect/Self Esteem	X
Community		Dignity of Each Person		Hospitality		Multicultural Understanding		Service			

Teacher Resources

ASSESSMENT EVIDENCE		
Assessment *for learning*	**Assessment *as learning***	**Assessment *of learning***
• Student reflection on both folio and practical progression, through the use of a Gantt Chart (Teacher to set check in dates for students) • Peer evaluations • Onguard testing	• Peer evaluations • Continuous reflection and self assessment of both theoretical and practical processes.	• Practical Project: serving board • serving board portfolio

LANGUAGE DEMANDS OF THE UNIT List the language that teachers will focus their activities around to assist in building an understanding of the unit and success in the performance task	
Technical Language	**Task Language**

(language associated with understanding the content) *e.g:*		(language associated with project requirements) *e.g: language of description, language of persuasion*
• Risk Assessment • Marquetry • Pyrography • Laser Engraving • Statement of Intent • Success Criteria • Selection and Justification • Orthogonal • Isometric • Oblique • CAD • Scroll Saw	• Tenon Saw • Finger Joint • WHS	• Evaluate • Discuss • Describe • Analyse • Identify • Justify

TEACHING AND LEARNING

Key: BLUE text = learning intention; BLACK text = Core activity; PURPLE text = Newman/extension activity; GREEN text = supported tasks; RED text = EAL/D resources; ORANGE text = supporting ATSI learners

Outcomes	Teaching and Learning Activities Including resources	Adjustments	Evidence of Learning	Register (incl. dates)
Design Students: • develop and produce practical projects allowing for the characteristics and properties of materials, systems, components,	Learning Intention: To design and develop a serving board that encompasses learning from previous units and undergo planning a more challenging project. ❑ T- discusses serving board overview: a major project for Year 9, unpacking of the project requirements and discussing students role in the development of their project. ❑ T- discusses requirements for the portfolio that	*Seating plan (SEAE) in ability groupings* *Chunked work and extra instruction for additional needs.*		**Term 2 week 3 Seares**

tools and equipment available, for example: (ACTDEK046) – *finishing* – *joining processes* – *material selection* – ~~*shaping processes*~~ • identify and investigate factors influencing design in timber projects, for example: – *grain* – *hardware* – *proportion* – *timber species* • use and/or modify existing designs when completing projects • calculate quantities and costs of materials and components used in the completion of projects, for example: – *use spreadsheets to calculate material quantities* ~~*and monitor project costs*~~ • apply project management techniques and follow a planned	will accompany the project and what may differ from previous portfolio's that have been completed e.g. Level of complexity, level of autonomous work/ work ethic. ❑ T/S- unpacking of Statement of Intent and recapping of the S.O.I requirements - W hat is being constructed - W hy project is being constructed OR W hat is the Need for the project, - W here the project will be placed - W ho is using the project Supported Task- EAL/D Resource: Statement of Intent scaffold ❑ S- To begin writing of S.O.I ❑ T- Leads discussion of factors that impact the design/ production of a project (e.g. Materials, Size, Time, Skill level,Proportion, availablility of hardware). Class brainstorm. ❑ S- Project Limitations are identified and expanded upon in S.O.I, eg budget ❑ T/S- Discussion around Success Criteria, (keeping in mind project limitations) and relating back to the question of "W HAT MAKES A GOOD PROJECT" Extension Activity: Discuss and answer question- W hat influences a project's success? E.g. Demographics, consumers want/ need, marketing/ branding etc. ❑ T- explains importance of research of existing designs and how evaluating of these designs can inform decision making in the planning of a project. (S - Driving question: How can previous		- Students verbal answers to questioning - W ritten statement of intent, including all requirements listed and project limitations and success criteria.	E Seares 18/5/24

sequence through to project completion • evaluate the impact of design and work practices/processes on the quality of finished projects	designs influence the planning of your project?) ❑ T/S- Existing design activity **LINK ACTIVITY** ❑			
Materials Students: • investigate the structure of trees and how they grow • describe the differences between hardwoods and softwoods and justify their selection in a range of projects • investigate the properties and working characteristics of solid timber, for example: – *colour* – *defects, eg gum veins in Tasmanian oak* – *density* – *Strength*	Learning Intention: Students are to research and justify each aspect of the serving board that is needed for construction ❑ Discuss with students research techniques and what is a credible source of information. ❑ Unpack with students research requirements of the portfolio and what is required in each research section: - Materials, eg main timber & manufactured boards - Joints, - Other Production Processes e.g. Marquetry, Laminating - Finishes - Accessories/ Components eg hinges, latches - Tools & Machinery ❑ Teacher discusses with students how to write a description for materials research, discussing the properties and characteristics of timber, eg colour, density, strength, defects, and how to evaluate its appropriateness to the S.O.I. (This is repeated throughout for each research section). ❑ Discuss with students Selection and Justification portfolio requirements and how to correctly justify selections made for the serving board.		- In- depth research of all areas of the serving board, accompanied with evaluations that have been related back to the S.O.I	**Term 2 week 3 E Seares**

• investigate timber conversion and seasoning processes, for example: – compare the advantages and disadvantages of air and kiln seasoning – utline and apply the appropriate method of stacking cut timber for seasoning and storage • identify differences in appearance and properties of radially and tangentially cut boards • contrast the properties and working characteristics of a range of timbers when planning and using timber for specific projects, for example: – *durability*	Areas that need to be justified are, but not limited to: - Design & Marquetry design - Materials - Joints - Finish - Accessories			

– *workability* ● identify, select and use a range of hardware and cabinet fittings in the completion of projects, for example: – *catches* – *drawer handles* – *hinges*				
Societal and environmental impact Students: ● ~~identify renewable and non-renewable resources in the timber industry~~ ● recognise the importance of conservation of materials and recycling in the timber industry, for example: – *recycling of timbers, eg beams from old warehouses* – *the use of plantation timbers in the production of manufactured boards* ● ~~investigate issues relating to the sustainability of~~	Learning Intention: To understand the positive and negative the Timber Furniture and Products Industry is having on society and the environment. ❑ Social and environmental impacts throughout the timber industry are reaffirmed through class discussions. ❑ Environmental links can be made to the serving board through selecting recycled timber for construction. ❑ Manufactured boards research is discussed, along with the positives and negatives of using manufactured boards, explaining the difference using plantation timbers for this purpose		- Students answering verbal questioning and engaging in class discussions. - In depth research evident in students portfolios and an accompanying evaluation of the impact of what had been researched.	**Term 2 week 9 E Seares**

resources in the timber industry, for example: – *old-growth logging* – *the use of plantation timbers* • explore the role of Aboriginal Peoples and organisations in sustainable forestry management • investigate technologies used in the timber industry to reduce the use of non-renewable resources, for example: – *use of finger jointed timbers* – *use of laminated veneered lumber (LVL) to conserve old-growth forests*				
Tools, equipment and techniques Students: • measure and mark out materials accurately from a workshop drawing	Learning Intention: Construct a functional serving board, following workshop drawings and utilising a range of machine/ hand tools. ❑ Project expectations are discussed with students. (Example projects can be shown, in order for students to visualise what needs to be achieved).	❑ Visual aid handouts detailing correct marking out and sawing procedure. Visuals include how to read a mm rule and correct		Term 3 week 1 E Seares

• select, use and adjust hand tools in the production of practical projects, for example: —— ~~*chisel a lap joint*~~ – *mark out using a try square and marking gauge* – *plane a timber edge in preparation for joining* – *using sash cramps to join two boards of timber* • accurately cut and prepare materials to size, for example: —— ~~*cutting curves in timber using a coping saw*~~ – *using a tenon saw to cut on waste side of line* • produce practical projects using machines and portable power tools, for example: – *cutting a curve using a jigsaw*	❑ Recap with students tool safety and introduce and discuss any new tools that will be used throughout the construction of the project. ❑ Discuss processes and practices that will be implemented throughout the project. Introduce the machine tools that students will be using for the project and recap safety. Students research marquetry and pyrography. This is followed by a class discussion on how they can be implemented onto their serving board and the design implications of them. **LINK MARQUETRY ACTIVITY** ❑ Demonstrate to the students the process of marking out each individual piece in relation to workshop drawings, accompanied with a demonstration of correct sawing techniques. ❑ Recap safe use of disc sander and correct pre-operational checks. Demonstrate correct operation of disc sander. ❑ ~~Students to cut out framing pieces for their serving board, applying the knowledge gained from demonstrations.~~ ❑ Demonstration of how to correctly measure and mark out finger joint. ❑ Teacher demonstrates how the various ways to cut out the fingers: ➢ Tenon saw/ Coping saw and chisel: Discusses the parts of a chisel and differing types of chisels and their use. Demonstrates correct way to secure	handling of a saw - Handling aid (If required): Student to clamp piece being cut to bench hook, to aid in stability of the piece. - Chunked information to aid in better understanding of concepts and the process being completed. - Visual aid of finger joint, detailing measurements, accompanied with a pictorial procedure. - Visuals aids accompanies each new skill or process being taught to aid in comprehension and understanding. - Verbal questioning to further student engagement and understanding.		E Seares 2/8/24 2/8/24 ESeares

– *cutting a profile using a router* – *sanding a surface using an orbital sander* – ~~*turning a small bowl*~~ • ~~maintain hand and machine tools~~ • identify and use a variety of joining methods, for example: – *adhesives/glue* – ~~*nails/screws*~~ • identify and cut a range of timber joints, for example: – *box joints, eg rebate, housing, mitre* – *carcase joints, eg mortise and tenon, bridle* – *widening joints, eg biscuit* • incorporate features into projects, for example: – ~~*drawers*~~ – *lids*	piece in order to cut vertically with the tenon saw and how to clamp for chiselling and parring of the timber ➢ Scroll Saw: Teacher discusses safety precautions when operating the scroll saw and the pre- operational checks. Followed by a demonstration of correct operation techniques and how to accurately cut out the finger joint. ❑ Students are shown how to conduct a dry assembly of their project after joints are cut out. Teacher discusses reasons for a dry assembly and why it is useful to check for squareness. (This demonstration can be accompanied by explaining the different types of clamps and their differing functions). Extension Activity: Students to research the different types of clamps and discuss/ justify their appropriateness for clamping the frame of the serving board. ❑ Students use the same clamping techniques from the dry assembly, to glue and assemble their serving board frame. ❑ Inform students of how to adjust/ fix serving board frame if it is out of square. ❑ ~~Teacher to demonstrate safe operation of trimmer, to cut the groove for the base of the serving board. Students are to then complete relevant ONGUARD training. Engage class discussion as to why the base is recessed into the frame and are there alternative ways to achieve this.~~			E Seares 26/7/24 26/7 /24

• select and prepare timber for the lathe, for example: – etween centres turning – aceplate turning • set up and use lathe techniques for basic turning processes, for example: – etween centres turning, eg rolling pin, mallet handle – up chuck or screw chuck turning, eg drawer knob, egg cup • explore timber decoration techniques, for example: – *laser engraving* – *marquetry* – *pyrography* – *veneering*	❑ Safe operation of the jigsaw is discussed and measuring and marking out of serving board base is demonstrated. ❑ Students to cut out groove, so that their bases are recessed into the frame and assembled. ❑ Discuss with students around planning out and measuring the hardwood timber for their serving board. (A further discussion around widening joints and joining different types of timber can be had if required) ❑ Teacher discusses edge treatment and demonstrates the cutting of the edge treatment with a trimmer. ❑ Discuss importance of using a template when planning out Marquetry design. Students to cut out template and trace onto chosen veneer timber. (This process can be changed to either laser engraving and/ or pyrography, depending on the resources available) (Laser engraver is linked with how it is used in the industry) ❑ Teacher engages students in a class discussion: ○ W hat is a timber finish? - W hy is timber finishing critical for the long term durability of timber projects? - W hat finishing options are commonly used within industry context? - W hat are the specific needs of the project that will dictate possible			E Seares Term 2 week 10 E Seares

• identify reasons for preparing surfaces and applying timber finishes • describe a range of timber finishes and their applications, for example: – *clear finishes* – *oils* – *stains* • apply a range of processes and techniques for finishing timber, for example: – *applying an oil finish* – *Burnishing* • ~~investigate tools and techniques used by Aboriginal and/or Torres Strait Islander Peoples to manipulate timber and the environment, for example:~~ – ~~*selection of an appropriate tree for didgeridoo production*~~ • investigate advanced manufacturing techniques to assist in the production	finishing options? ❑ Teacher demonstrates a variety of ways in which to prepare timber for applying a finish. Different abrasives, ridding the timber of dents and scratches ❑ Teacher demonstrates how to apply clear finish to their projects, and identify issues with applying these finishes. ❑ Students are to move through the process of preparing, and applying finish to their jobs. ❑ Demonstration on how to mark out and measure placement of hinges. Discussion is had on different types of hinges and what ways can a hinge be attached to either be functional or decorative. ❑ Students are to be documenting the construction process throughout the duration of the serving board project. ❑ Class discussion on construction process that was undertaken and evaluated in relation to S.O.I			

of projects, for example: – *CNC equipment, eg laser cutters, CNC milling machines* – *rapid prototyping* ● evaluate techniques used in the construction of a project **Tools, equipment and techniques** Students: ● identify hand, machine and power tools in the production of practical tasks, for example: – *saw* – *router* – ~~*cordless drill*~~ – ~~*pedestal drill*~~ – *disc sander* ● use hand tools in the production of practical tasks, for example: – ~~*creating a lap joint with a chisel*~~ – ~~*cutting curves in timber with a coping saw*~~				

– *marking out with a try square* – *planing an edge of timber* – *securing timber with a bench hook* – *using sash cramps to join two boards of timber* ● use machine and power tools in the production of practical tasks, for example: ✸ – ~~*cutting a curve using a jigsaw*~~ – ~~*drilling a hole for insertion of a dowel*~~ – *sanding end grain on a disc sander* – *joining timber using a biscuit cutter* – *sanding timber surfaces with an orbital sander* – ~~*shaping a curve with a drum sander*~~ ● ~~explore the application of jigs in the production of machining and/or cabinetmaking projects~~ ✸				

• explore the properties and application of specialist tools used in the preparation, cutting, shaping and joining of construction projects, for example: – *squaring the end of a piece of timber using a disc sander* – *moulding an edge using a router* – ~~*turning a rolling pin on a lathe*~~ • identify features of tools that make them hazardous and suggest ways to reduce risk, for example: – *heat* – *movement* – *sharpness* • ~~identify and apply safe practices to maintain and store tools, for example:~~ – ~~*sharpening a chisel*~~ – ~~*removing excess sawdust*~~				

• identify a range of techniques in the construction of a project, for example: – *measuring* – *cutting* – *joining* – *finishing* – ~~*Turning*~~ • apply techniques to measure and prepare timber materials, for example: – *measure length to be cut using a rule* – *marking out cut lines* – *securing timber before use, eg vice or bench hook* • apply techniques to join materials, for example: – *joints* – *screws* – *rivets* – *nails* – *adhesives* – *clamps* • apply techniques for surface finishes to				

timber materials, for example: – *lacquers* – *oils* – *stains* – *paints* ~~● explore techniques for woodturning with a lathe, for example:~~ ~~– *between centres turning*~~ ~~– *faceplate turning*~~ ● evaluate techniques used in the construction of a project				
Workplace communication skills Students: ● recognise and comply with WHS signage, for example: – *identify the colours and shapes associated with types of WHS signage* ● select and use specialist terminology	Learning Intention: Understand the different workplace communications used in the timber context and produce workshop drawings to AS1100 standard. ❑ W orkshop signage is recapped with students, identifying the different types of signs are there purpose in the workshop. ❑ Students are to research different types of drawing techniques used in the construction process and to create a glossary providing both a picture example and definition. ❑ Students to practice drawing their project ideas, in the idea generation section of their portfolio.	- Use of visual aids and labelled drawings	- Students' accurately producing design sketches and working drawings, to a AS1100 standard. - A cutting list that accurately reflects chosen final design. - A CAD visual representation of serving board final design, with annotations and measurements.	**Term 2 wks 8-10 E Seares 2024**

in context, for example: – *develop a glossary* – *procedure/record of production* ● read and interpret plans and/or materials lists to prepare materials for the completion of projects, for example: – *workshop drawings of joints* ● produce freehand sketches of project components and/or projects ● develop design and production folios using appropriate ICT, for example: – *CAD* – *spreadsheets* ● prepare design and production folios to describe the management and processes undertaken in	❑ Teacher provides examples of project working drawings and the requirements needed to produce a working drawing of the serving board ❑ Students to complete final design working drawings of their serving board (Orthogonal and Isometric). ❑ Teacher demonstrates how to recreate students final design on a CAD program. ❑ Students to complete a CAD drawing of their final design. Extension Activity: Rendering and hatching final CAD drawing ❑ Discuss with students how to create a cutting list for the serving board, using their final design working drawings. Students are to then complete their own personal cutting list. ❑  **LINK W ORKING DRAW ING**			E Seares

the production of practical projects				
WHS and risk management Students: ● demonstrate safe workshop practices and procedures, for example: – *clamp materials securely when cutting or drilling* – *lift and carry materials safely* – *manage trip hazards in the workshop* – *work collaboratively* ● safely use and maintain hand, power and machine tools ● select and use personal protective equipment (PPE) when working with tools, materials and machines, for example: – *wear appropriate footwear* – *wear eye protection, eg safety glasses when drilling*	Learning Intention: Understand the safety requirements of the machines, tools and processes associated with constructing the serving board ❏ Students are refamiliarised with the safety requirements of the workshop through demonstration and working collaboratively. ❏ Students complete review of previous relevant ONGUARD testing when applicable from term 1 ❏ Students complete a risk assessment for the workshop and identified tools/ machines associated with the construction of the serving board.			**15/8/24 ESEAE**

– *wear protective clothing* • apply the principles of risk management, for example: – *identify a particular risk and implement risk-reduction procedures* • ~~describe elementary first aid procedures, for example:~~ – ~~*outline the procedure to follow after a particular incident, eg burns and cuts*~~				
Links to industry Students: • compare industrial production processes to those used in the classroom, for example: – *application of timber finishes* – ~~*using jigs and templates*~~	Learning Intention: Understand how the processes being completed in the school workshop link/ compare with industrial practice ❑ Discussion around application of finish techniques used in the industry and how they compare to classroom practice.			**2/12/231** **AASL**

~~investigate historical technologies related to the timber industry~~ ~~investigate a range of career paths in the timber and related industries, for example:~~ ~~*carpenter*~~ ~~*cabinetmaker*~~ ~~*joiner*~~ ~~*wood machinist*~~				

REGISTRATION AND EVALUATION				
Class	**Teacher**	**Date Started**	**Date Completed**	**Evaluation**
9itt	Seares	Term 2 2024		*Link to Staff Evaluation* *Link to Student Evaluation*

Recommendations stemming from responses to Staff and Student Evaluations
1. 2. 3.