Unit 306: Set up and use fixed and transportable machinery

Sample scheme of work

Please revise the following text to suit your requirements.

This sample scheme of work covers both classroom and workshop-based learning for Unit 306. It is based on three-hour sessions with a 15-minute break halfway through each session. The unit has 12 theory lessons covering machine safety, technology and use, with a further theory/practical session concentrating on risk assessments. These are followed by 16 practical sessions enabling the learner's time to practice activities involved with using machinery. Within the practical activities there is scope to challenge and stretch learners.

This is an example only of a possible scheme of work and is based on theory and practical within an FE centre delivering the Level 3 Advanced Technical Diploma in Architectural Joinery. Unit 306 is designed as a stand-alone unit and should be used in conjunction with the standards set for the qualification to ensure full coverage of the learning requirements.

You can use the sample scheme of work as it is, adjust it or extract content to create a scheme of work to suit your delivery needs. It can also be adjusted by adding theory and practical workshops to support learners who have/need additional learning time.

Reference is made within the scheme of work to learning materials and other resources required for each session. A version of this scheme of work with **full supporting materials** is also available to purchase on **SmartScreen.co.uk**. Resources consist of physical equipment required, as well as any technologies needed. Where possible we have included blended learning activities that make good use of technology so as to help centres fulfil the minimum amount of digital teaching recommended by government.

Centres should also incorporate the following themes, where appropriate, as strands running through each of the sections within the qualification. Although they are not specifically referred to in the section content section, City & Guilds regards these as essential in the teaching of the qualification:

- health and safety considerations, in particular the need to impress upon learners the fact that they must preserve the health and safety of others as well as themselves
- functional skills (mathematics, English and ICT)
- extension tasks and differentiation, inclusion, entitlement and equality issues
- spiritual, moral, social and cultural issues
- environmental education and related European issues
- British Values
- values and behaviours
- use of information learning technology (ILT).

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Unit 306: Set up and use fixed and transportable machinery

Sample scheme of work

Course/qualification: _____ **Tutor's name**: _____

Number of sessions: 30 **Delivery hours**: 90 **Venue**: _____ **Group**: _____

Aims	**To enable learners to:**
The aim of this unit is to provide the learner with the knowledge to: • understand and use legislation and documentation relating to the safe use of woodworking machinery • carry out the inspection and maintenance of fixed and transportable machinery • use sawing machines • use planing machines • use a morticing machine	• Safely set up machinery • Perform basic maintenance on machinery • Use the following fixed and transportable machinery: — rip saws — crosscut saws — narrow band saws — surface planer, thicknesser and combination planers

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Theory activities **Session 1** (3 hours)	**Learning outcome 1: Understand and use legislation and documentation relating to the safe use of woodworking machinery** **Topic 1.1 Legislation** **Topic 1.2 Manufacturer's literature and maintenance schedules** **Topic 1.3 Supervision and training records** **Topic 1.4 Risk assessments** • Understand the legislation relating to the safe use of woodworking machinery	**Activities:** • Review previous session • Tutor to outline the main safety aspects associated with woodworking machinery: — legislation — machine specific safety aspects — general safety aspects • Learners to complete Activity 1 by identifying the main forms of legislation associated with woodworking machinery • Learners to complete Activity 2 in small groups by identifying the main machine specific safety aspects of using woodworking machinery **Resources:** • Activity 1: A set of statements about legislation associated with woodworking machinery for learners to marks as either true or false • Activity 2: Learners to a) list five machine-specific safety aspects that should be considered; b) identify three pieces of information to be found in the manufacturer's instructions; c) give three reasons why maintenance should be carried out; d) identify three areas that training must cover; e) briefly outline three actions that need to be taken when noise levels exceed 80 db(A); f) list three considerations employers must make while conducting risk assessments • Copy of ACoP for Provision and Use of Work Equipment Regulations 1998 as applied to woodworking machinery: http://www.hse.gov.uk/pubns/priced/l114.pdf	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
		• Examples safe working practice in controlling wood dust: http://www.hse.gov.uk/woodworking/videos/wood-dust-exposure.mp4 http://www.hse.gov.uk/pubns/wis23.pdf • Link to noise loss video: http://www.hse.gov.uk/noise/video/hearingvideo.htm • Link to retro fitting breaking devices: http://www.hse.gov.uk/pubns/wis38.pdf • Link to tooling: http://www.hse.gov.uk/woodworking/tooling.htm	

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Theory activities **Session 2** (3 hours)	**Learning outcome 2: Carry out the inspection and maintenance of fixed and transportable machinery** **Topic 2.1 Inspection, fault diagnosis and maintenance** • Discuss and outline requirements of inspection, reporting and maintenance for woodworking machinery	**Activities:** • Review previous session • Tutor to outline the main safety aspects associated with: — inspection — fault diagnosis — fault reporting — maintenance • Using Activity 3: Maintenance, learners to complete questions on maintenance • In small groups learners to complete Activity 4: Maintenance log sheet to produce a maintenance log sheet • In small groups, learners to discuss maintenance plans and complete Activity 5 by producing a maintenance log sheet. To complete this activity, learners need to complete the following steps: — Step 1: Identify the typical areas that would require maintenance on fixed and transportable machinery. — Step 2: Make a suitable maintenance log sheet using a format of their choice listing each of the areas identified in Step 1. — Step 3: On completion of the maintenance log sheet, present it and discuss your choices with the group. The maintenance log sheet will be used later in the course when learners carry out machine maintenance in the workshop. • In small groups learners to complete Activity 5 by discussing how the Provision and Use of Work Equipment Regulations (PUWER) affect the safe use of woodworking machines and answering the questions	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
		Resources: • Activity 3: A set of statements about maintenance for learners to marks as either true or false • Activity 4: Learners to produce a maintenance log sheet. To help the learners develop a maintenance log sheet for woodworking machines, have available a copy of a manufacturer's information book for at least one machine in your establishment along with a copy of a hazard data sheet for one of the lubricants to be used. This information will be used as an aide-mémoire for the learners, it is not expected all the learners will produce the same format for the logbook. The finished log sheet will be used in the practical activities covering maintenance. The same principle could be adopted to enable logbooks for reporting faults and inspection processes. • Activity 5: Learners to discuss the following and identify the main areas of concern for machines used in your establishment. In this case, a circular saw bench has been used but this can be substituted for another type of machine as necessary. Learners to consider: a) compliance with regulatory bodies; b) suitability of machine for intended use; c) method of reporting faults and damaged equipment; d) maintenance of the circular rip saw; e) recording maintenance carried out on circular rip saws	

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Theory activities **Session 3** (3 hours)	**Learning outcome 1: Understand and use legislation and documentation relating to the safe use of woodworking machinery** **Topic 1.4 Risk assessments** • Carry out risk assessment for inspecting and maintaining fixed and transportable machinery	**Activities:** • Learners to produce a risk assessment for inspecting and maintaining fixed and transportable machinery. • Learners to complete Activity 6 by answering the questions on risk assessment. • In small groups, learners to discuss risk assessment forms and complete Activity 7 by producing a standard risk assessment form in readiness to be used in maintaining the woodworking machines where they work. To complete this activity learners need to take the following steps: – Step 1: Identify the typical areas that would appear in risk assessments. – Step 2: Make a suitable risk assessment sheet for use with fixed and transportable machinery. – Step 3: List the expected hazards, risk levels, control measures and people involved in carrying out each stage of the maintenance schedule. **Resources:** • Activity 6: Learners to: a) outline the aim of a risk assessment; b) list the key stage of a risk assessment; c) define a hazard and a risk; d) list three examples of hazards found while maintaining fixed and transportable machinery • Activity 7: Learners to produce a risk assessment form. To help the learners develop and complete a risk assessment form for maintaining woodworking machines, several links are available which can be passed onto the learners as you see fit. This information is aimed as an aide memoire for the learners and not to copy	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
		wholesale, it is not expected that the learners will produce the same risk assessment format or identify all the same hazards and associated risks. The finished format of risk assessment will be used in the practical activities covering maintenance. Furthermore, the same principle could be adopted to enable the risk assessment form to be used in assessing hazards and risks while using fixed and transportable machinery. • Link to 5 steps to risk assessment: http://www.hse.gov.uk/pubns/indg163.pdf • Link to sample blank risk assessment form: http://www.hse.gov.uk/risk/safety-policy-risk-assessment-template.odt • Example safe working practice in controlling wood dust: http://www.hse.gov.uk/pubns/wis23.pdf • Video on wood dust: http://www.hse.gov.uk/woodworking/videos/wood-dust-exposure.mp4 • Link to model risk assessment for workshop: http://www.hse.gov.uk/risk/casestudies/pdf/woodworking.pdf • Link to noise loss video: http://www.hse.gov.uk/noise/video/hearingvideo.htm	

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Theory activities **Session 4** **(3 hours)**	**Learning outcome 3: Use sawing machines** **Topic 3.1 Saw materials to size and shape** **3.2 Use safety aids, features and extraction** • Understand how to select and safely set up sawing machines: – circular rip saw – dimension saw – crosscut saw	**Activities:** • Tutor to outline how to select and safely set up sawing machinery to: – rip softwood to width and thickness – cut manufactured board cut to given dimensions – cut tapered firings/wedges – cut arris rail/glue blocks – change tooling • Learners to complete Activity 8 by identifying component parts of circular rip saw bench • Learners to complete Activity 9 by identifying component parts of crosscut saw bench • Learners to complete Activity 10 by sketching teeth suitable for ripping down the grain and cutting across the grain of timber and labelling the major parts **Resources:** • Activity 8: Diagram of a rip saw bench for learners to identify the following component parts: a) top guard/crown guard; b) push stick; c) extraction pipe; d) guards for belts and pulleys; e) stop/start buttons; f) extension table; g) isolator; h) blade rise/fall; i) rip fence; j) riving knife; k) groove for fence • Activity 9: Diagram of a crosscut saw bench for learners to identify the following component parts: a) saw guard; b) swivel head lock; c) stop/start control; d) extraction hose point; e) radial arm; f) prohibition (no hands) area; g) saw blade; h) adjustable nose guard; i) saw housing with extraction; j) emergency stop • Activity 10: Learners to sketch and label teeth suitable for ripping down the grain and cutting across the grain of timber	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Theory activities **Session 5** **(3 hours)**	**Learning outcome 3: Use sawing machines** **Topic 3.1 Saw materials to size and shape** **Topic 3.2 Use safety aids, features and extraction** **Topic 3.3 Use workpiece support** • Understand how to select and safely set up sawing machines: — circular rip saw — dimension saw — crosscut saw	**Activities:** • Review previous session • Tutor to outline how to set up and use: — circular rip saw/dimension saw — crosscut saw • Tutor to outline how to safely produce timber and timber based products including: — ripping softwood to width and thickness — ripping manufactured board cut to given dimensions — producing tapered firings/wedges — producing arris rail/glue blocks — crosscutting long lengths of material — crosscutting short lengths of material • Learners to complete Activity 11 by identifying how to set up and use rip saws. • Learners to complete Activity 12 by identifying how to use push sticks safety. • Learners to complete Activity 13 by identifying how to offer materials safely for cutting operations. • Learners to complete Activity 14 by identifying safe operational procedures for crosscut saws. **Resources:** • Activity 11: Learners to a) state three ways a circular saw should be guarded; b) state four basic conditions required for circular saws to work effectively; c) sketch the position of the crown guard in relation to the material being cut and label the major components • Activity 12: Learners to a) sketch and label the correct position of the	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
		riving knife for saw blades with a diameter of less than 600mm; b) sketch and label the correct position of the riving knife for saw blades with a diameter greater than 600mm; c) sketch the correct position of the out-feed extension table and label its minimum length; d) sketch a push stick and label its critical measurements • Activity 13: Learners to a) list the following defects commonly found in timber; b) Sketch and label the correct position for feeding cupped material through the rip saw when flatting; c) Sketch and label the correct position for feeding material that is bowed through the rip saw when flatting; d) Sketch and label the correct position for feeding material that is sprung through the rip saw • Activity 14: Learners to a) show how to position material that is sprung and bowed on the crosscut saw with the aid of sketches; b) describe how you to position your hands and guard before starting to cut material on a crosscut saw and why; c) show how to cut short lengths on the crosscut saw; d) explain what additional safety aid should be used when crosscutting long lengths of timber and why • Video link to using rip saws: http://www.hse.gov.uk/woodworking/ripsaw.htm • video link to crosscut saws: http://www.hse.gov.uk/woodworking/crosscut.htm • link to circular saw poster: http://www.hse.gov.uk/pubns/circular-saw.pdf • link to circular saw guidance sheet: http://www.hse.gov.uk/pubns/wis16.pdf • link to crosscut guidance sheet: http://www.hse.gov.uk/pubns/wis36.pdf • link to braking devices: http://www.hse.gov.uk/pubns/wis38.pdf • link to powered crosscut: http://www.hse.gov.uk/pubns/wis35.pdf	

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Theory activities **Session 6** (3 hours)	**Learning outcome 3: Use sawing machines** **Topic 3.1 Saw materials to size and shape** **Topic 3.2 Use safety aids, features and extraction** **Topic 3.3 Use workpiece support** **Learning outcome 5: Use a morticing machine** **Topic 5.1 Cut mortices** **Topic 5.2 Use workpiece support** • Understand how to select and safely set up sawing machines: – narrow bandsaw – hollow chisel morticer	**Activities:** • Review previous session • Tutor to outline how to set up and use narrow bandsaws • Learners to complete Activity 15 by identifying how to set up and use narrow bandsaws to produce components • Learners to complete Activity 16 by describing the correct procedure for changing a narrow bandsaw blade and setting up the machine ready for cutting operations • Tutor to outline how to set up and use hollow chisel morticer • Learners to complete Activity 17 by describing the correct procedure for changing a 10mm hollow chisel set ready for cutting. • Learners to complete by stating a possible reason for each of the hollow mortice chisel faults listed and suggesting actions that could be taken to correct the fault **Resources:** • Activity 15: Learners to a) state three considerations to be taken into account when selecting a blade for a bandsaw; b) sketch and describe the correction positioning of the guide assembly in relation to the saw blade • Activity 16: Learners to list the considerations to be taken into account when replacing a narrow bandsaw blade, using sketches where necessary to aid descriptions • Activity 17: Learners to list the considerations to take into account when replacing a hollow square mortice chisel, using sketches where necessary to aid descriptions • Activity 18: Learners to complete by stating a possible reason for each of the following faults and suggesting actions that could be	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
		taken to correct the fault: a) mortice is not at right angle to the fence; b) bottom of the chisel set leaves the corners of the chisel producing an uneven bottom to the mortice; c) chisel shows signs of burning; d) chisel develops a crack; e) bottom of the auger has a broken wing • Video link to narrow bandsaws: http://www.hse.gov.uk/woodworking/bandsaw.htm • Link to narrow bandsaws: http://www.hse.gov.uk/pubns/wis31.pdf	

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Theory activities **Session 7** (3 hours)	**Learning outcome 4: Use planing machines** **Topic 4.1 Plane timber to size and shape** **Topic 4.2 Use safety aids and features** **Topic 4.3 Use workpiece support** • Understand how to select and safely set up planing machines: – surface planer – thicknesser – combination planer	**Activities:** • Review previous session • Tutor to outline how to set up and use a surface planer • Learners to complete Activity 19 by identifying components of a surface planer • Learners to complete Activity 20 by explaining the importance of the positioning of the cutter block and the in-feed and out-feed tables using diagrams • Learners to complete Activity 21 by identifying the correct positioning of the bridge during planing operations **Resources:** • Activity 19: Diagram of a surface planer for learners to identify the following components: a) fence check plate; b) fence; c) in-feed table; d) in-feed rise and fall lever; e) out-feed table; f) fence bar; g) table locks; h) start and stop switches; i) bridge guard; j) depth of cut gauges; k) isolator • Activity 20: Learners to explain the correct positioning of the machine bed on a surface planer using sketches • Activity 21: Learners to draw the correct position of the bridge for the following uses: a) combined facing and edging on the surface planer; b) facing of thin wide boards; c) combined facing and edging of wide square material • Video link to surface planer**:** http://www.hse.gov.uk/woodworking/planer.htm • Link to surface planer: http://www.hse.gov.uk/pubns/wis17.pdf • Link to wood dust**:** http://www.hse.gov.uk/pubns/wis23.pdf	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Theory activities **Session 8** (3 hours)	**Learning outcome 4: Use planing machines** **Topic 4.1 Plane timber to size and shape** **Topic 4.2 Use safety aids and features** **Topic 4.3 Use workpiece support** • Understand how to select and safely set up planing machines: – thicknesser – combination planer	**Activities:** • Review previous session • Tutor to outline how to set up and use a: – thicknesser – combination planer • Learners to complete Activity 22 by identifying components of a thicknesser • Learners to complete Activity 23 by designing a suitable jig for producing tappers on the thicknesser **Resources:** • Activity 22: Diagram of a thicknesser for learners to identify the following components: a) cutter block; b) out-feed pressure bar; c) in-feed roller; d) rise and fall table; e) in-feed chip breaker; f) out-feed roller • Activity 23: Learners to draw and label a suitable jig that could be used to produce a sample tapered baluster for use on a turning staircase in order to help a customer decide what type of finish to have on the balustrade • Link to wood dust: http://www.hse.gov.uk/pubns/wis23.pdf	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Theory and practical activities **Session 9** **(3 hours)**	**Learning outcome 3: Use sawing machines** **Topic 3.1 Saw materials to size and shape** **Learning outcome 4: Use planing machines** **Topic 4.1 Plane timber to size and shape** **Learning outcome 5: Use a morticing machine** **Topic 5.1 Cut mortices** • Understand how to carry out risk assessment for setting up and using: — sawing machines — planing machines — morticing machines	**Activities:** • Review previous session • Tutor to refresh learners' understanding of risk assessments, concentrating on the setting up and use a rip saw • Learners to complete Activity 24 by conducting a workshop survey of the machines intended to be used to complete this unit, identifying all significant hazards associated with each machine • Learners to complete Activity 25 by identifying safety aids and control measures needed during use • Learners to complete Activity 26 by producing risk assessment for all machines **Resources:** • Activity 24: Learners to survey the workshop and identify all the significant hazards for each of the machines listed: a) circular rip saw; b) cross-cut; c) narrow bandsaw; d) planer; e) thicknesser; f) morticer. Any additional tasks will also need to be taken into consideration when deciding on significant hazards • Activity 25: Learners to identify all of the control measures and safety aids they are likely to require during the machining operations for the machines listed in Activity 24 • Activity 26: Learners to develop a suitable risk assessment to be used when producing timber and timber based components • Link to risk assessment: http://www.hse.gov.uk/risk/casestudies/pdf/woodworking.pdf	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Practical activity **Sessions 10–29** (48 hours)	**Learning outcome 1: Understand and use legislation and documentation relating to the safe use of woodworking machinery** **Learning outcome 2: Carry out the inspection and maintenance of fixed and transportable machinery** **Learning outcome 3: Use sawing machines** **Learning outcome 4: Use planing machines** **Learning outcome 5: Use a morticing machine** • Construct door linings to given specifications • Produce door lipping to given specifications • Produce balusters to given specifications • Produce hand railing and string capping to given specifications • Produce newel posts to given specifications • Construct wedges and glue blocks to given specifications	**Session 10 to 29: practical workshop activities following relevant regulations and workshop rules. Set up and woodworking machines.** **Activities:** • Follow relevant health and safety guidance • Prepare method statement for machining exercises • Select correct tools and safety equipment to prepare timber for machining. • Use the following machines: — rip saw — crosscut saws — narrow bandsaws — planing machines — thicknessing machines — mortice machines • Mark out material • Cut materials • Plan materials • Mortice materials **Resources:** • Selection of timber and timber-based material • Appropriate woodworking machinery • Portable power tools • Hand tools	• Observation • Q&A • Practical activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
	• Construct window board and corner posts • Select and use appropriate tools and safety aids for the given task in accordance with current regulations • Follow current environmental and relevant health and safety regulations relevant to using woodworking machinery	• Activity 26: Machine usage risk assessment • Individual learning plans: for each session, learners should outline the objectives that they reasonably expect to complete in that session. As the sessions progress, feedback from the previous sessions will guide and focus their future learning aims and objectives. • Double door frame specification. The door opening sizes can be adjusted within reasonable variations to suit the availably and sizes of materials available within your workshop. It is intended that every learner undertakes the setting up and use of the machines above for the task outlines. • Bay window specification. The window opening sizes can be adjusted within reasonable variations to suit the availably and sizes of materials available within your workshop but should be about 900mm high and 1150mm wide. The bay window can be a splayed or segmental bay with a projection of 300mm. The window board should be of a suitable size to allow for accurate bisection of the angle and production of the mitre for of the window board. • Balusters and balustrade specification. The stair sizes can be found in Unit 304 and can be adjusted within reasonable variations to suit the availably and sizes of materials available within your workshop. It is intended that every learner undertakes the setting up and use of the machines above for the task outlines	

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Theory activity **Session** **30** (3 hours)	**Learning outcome 1: Understand and use legislation and documentation relating to the safe use of woodworking machinery** **Learning outcome 2: Carry out the inspection and maintenance of fixed and transportable machinery** Review of unit	**Activities:** • Learners to review Unit 306 and complete multiple choice questions **Resources:** • Set of 20 end of unit multiple choice test questions to check learner's understanding of the unit	• Observation • Q&A • End of unit questions

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