Unit 308: Manufacture stairs with turns

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 308. It is based on three hour sessions each having a 15 minute break half way through the session. The unit has 6 theory lessons covering manufacturing stairs with turns. These are followed by 33 practical sessions enabling the learner's time to practice activities involved with manufacturing curved joinery. 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 Diploma in architectural joinery. Unit 308 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)
- Learners to prepare a few brief notes in small group discussions on the possible implications of not following health and safety regulations.

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Unit 308: Manufacture stairs with turns

Sample scheme of work

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

Number of sessions: 40 **Delivery hours**: 120 **Venue**: _____ **Group**: _____

Aims	**To enable learners to:**
Enable the learners to: • set out stairs with turns • manufacture stairs with turns • assemble stairs with turns	• Set out stairs with turns, including: — recognise turning stair arrangements — recognise turning stair components — understand information required to set out stairs — calculate rise and going to conform to Building Regulations — set out stairs • Manufacture stairs with turns, including: — mark out stair components — component jointing methods — constructing steps — constructing handrails and balustrades • Assemble stairs with turns, including: — dry fitting and preparing surfaces — assembling stairs and carrying out quality checks

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Theory activities **Session 1** (3 hours)	**Learning outcome 1: Set out stairs with turns** **Topic 1.1: Turning stair arrangements and types of stair with turns** • Understand the types of turning stair arrangement possible and how the chosen arrangement is dependent on the space available for the stair to fit in.	**Activities:** • Introduce unit and outline work programme for completion of unit • Tutor to outline the main designs of staircases with turns: — quarter and half space landings — open-well and dog leg arrangements — quarter and half space of winders/tapered steps — closed and cut string — geometrical stairs with continuous strings (non-newel stairs) • Learners to complete Activity 1 by marking statements on manufacturing stairs with turns as either true or false • Learners to complete Activity 2 by identifying the type of staircases shown and giving a brief description of each one • Tutor to outline the advantages and disadvantages of manufacturing and fixing by using winders • Tutor to outline the complexity of geometrical stairs with continuous strings (non-newel stairs) **Resources:** • Activity 1: A series of true and false statements about turning stair arrangements • Activity 2: Drawings showing the following different stair arrangements for learners to identify and describe: a) open-well stair; b) geometrical or helical stair. • Link to building regulations: http://www.planningportal.gov.uk/buildingregulations/	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Theory activities **Session 2** (3 hours)	**Learning outcome 1: Set out stairs with turns** **Topic 1.2: Turning stair component terms and their sectional sizes** • Identify components used in turning stairs including: — suitable section sizes for components — Building Regulation minimum going for winder steps	**Activities:** • Recap on previous session • Tutor to outline the following components used in turning staircases: — balusters, balustrade, brackets, cap, carriage piece, cover fillet, bullnose step, commode step, curtail step, drop newel, easing, finial, flier, flight, glue blocks, going, handrail, newel post, nosing, rise, riser, scotia, shaped bottom step, spandrel, splayed step, staircase, step, string capping, baluster spacers, strings, tread, winders/tapered steps, wreathed handrail and wreathed string. • Learners to be able to identify component characteristics • Learners to complete Activity 3 by marking statements on stair components as either true or false • Learners to complete Activity 4 by identifying the components for turning stairs • Learners to complete Activity 5 by sketching the types of handrailing used in turning staircases **Resources:** • Activity 3: A series of true and false statements about stair components • Activity 4: A drawing of a turning stair showing the following components for leaners to identify: a) balustrade; b) bullnose step; c) nosing; d) quarter-turn landing; e) stringer; f) riser; g) tread; h) newel post • Activity 5: Learners to sketch each of the following types of handrailing used in turning staircases: a) ramps; b) keens; c) bends	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
		• Video link to fitting winder treads: https://youtu.be/rgcKj0yBI8k	
Theory activities **Session 3** (3 hours)	**Learning outcome 1: Set out stairs with turns** **Topic 1.2: Turning stair component terms and their sectional sizes** **Topic 1.3: Information required to set out stairs from a site survey** **Topic 1.4: Calculate rise and going to conform to Building Regulations** • Describe information used to set out stairs from surveys: — architects' drawings — specifications, — manufacturers' catalogues — Building Regulations (Approved Document K)	**Activities:** • Recap on previous session • Tutor to outline the importance of using correct sectional sizes in relation to components used in turning staircases • Learners to complete Activity 6 by marking statements on component sizes as either true or false • Tutor to outline types of information necessary to produce turning staircases • Learners to complete Activity 7 by identifying the typical information sources used when setting out staircases and giving a brief description of the information likely to be gained from each source • Tutor to outline Building Regulation Approved Document K in relation to turning staircases: — rise — going — pith — headroom — normal relationship check. • Learners to complete Activity 8 by marking statements on Approved	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
	— total rise and floor levels — available going headroom — positioning of joisting and door openings — accessibility • Calculate rise and going to conform to Building Regulations: — rise — going — pitch — headroom — 'normal relationship check'	Document K as either true or false • Learners to complete Activity 9 by checking the step combinations against listed against approved document K step normal relationship check and identifying which ones meet the required relationship standard • Small group discussions on the requirements of Building Regulations approved document k and principles learnt from activities, followed by whole group discussion. **Resources:** • Activity 6: A series of true and false statements about component sizes • Activity 7: Learners to identify the typical information sources used when setting out staircases and giving a brief description of the information likely to be gained from each source • Activity 8: A series of true and false statements about Approved Document K • Activity 9: A series of step combinations (giving the rise and going in mm) for learners to check which ones meet the required relationship standard • Links to Building Regulations: http://www.planningportal.gov.uk/uploads/br/BR_PDF_AD_K_2013.pdf http://www.bwf.org.uk/toolkit/technical-woodworking-support/stairs http://www.bwf.org.uk/assets/bwf-stair-design-guide-2013.pdf	

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Theory activities **Session 4** **(3 hours)**	**Learning outcome 1: Set out stairs with turns** **Topic 1.5: Set out stairs** • Describe how to set out a full sized plan and the sectional details required to manufacture a turning stair including: — produce scale elevations — produce cutting lists and order requisitions	**Activities:** • Recap on previous session • Tutor to outline the importance and advantages of full sized setting for: — winder treads — newel posts • Learners to complete Activity 10 by setting out a winder staircase to a scale of 1:20, showing the plan and the elevations of the wall strings • Learners to complete Activity 11 by drawing to half full size the step detail showing two treads and two risers for a staircase having a rise of 200mm and a going of 250mm. The drawing should show suitable jointing details along with the correct names for the individual components. Identify the pitch of the staircase. • Learners to complete Activity 12 by identifying jointing methods for strings to newels • Small group discussions on winder tread staircases and principles learnt from activities, followed by whole group discussion. **Resources:** • Activity 10: Learners to set out a winder staircase to a scale of 1:20, showing the plan and the elevations of the wall strings • Activity 11: Learners to draw to half full size the step detail showing 2 treads and 2 risers for a staircase having a rise of 200mm and a going of 250mm. The steps sizes can be changed to suit those the learners will be making. • Activity 12: Learners to sketch the jointing details used on strings	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
		and newels for the following locations: a) bottom newel; b) quarter-space landing newel; c) top newel	
Theory activities **Session 5** **(3 hours)**	**Learning outcome 1: Set out stairs with turns** **Topic 1.5: Set out stairs** • Describe how to set out a full sized plan and the sectional details required to manufacture a turning stair including: — produce scale elevations — produce cutting lists and order requisitions — draw to scale the surface developments required for geometrical strings	**Activities:** • Recap on previous session • Tutor to outline the importance and advantages of full-sized setting for geometrical strings • Learners to complete Activity 13 by setting out full-size the well string for a geometrical stair turning through 90°. The string has a radius of 300mm with 2 riser points at equal distance along the stretchout **Resources:** • Activity 13: Learners to set out a geometrical stair. The sizes can be substituted with ones that will be used during the learner's practical activities. • Drawing equipment • Setting out board	• Observation • Q&A • Activities
Practical activities **Sessions** **6 – 9** (12 hours)	**Learning outcome 2: Manufacture stairs with turns** **Topic 2.1: Mark out stair components** • Produce setting out details for:	**Activities:** • Recap on previous session • Tutor to outline setting procedures involved with turning stairs and produce setting out details for: — winder treads	• Observation • Q&A • Practical activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
	– winder treads – newel posts – geometrical strings	– newel posts – geometrical strings • Learners to complete Activity 14 by using the specification provided to produce the setting out for the plan view and side elevations of the winder treads, newel post and strings. Once the setting out has been completed, learners should produce a pitch board and wedge templates along with a cutting list for the major components required for producing the full flight of stairs. This cutting list will be used in the construction of the winder section only of the flight. • Learners to complete Activity 15 by setting out newel posts to the specification provided. Learners should include the mortice proportions in their setting out. Once the setting out has been completed, learners should produce a cutting list for the required newel posts. • Learners to complete Activity 16 by setting out geometrical stairs to the specification provided, showing the curvature in plan for the three turning steps through 90°. Once the setting out has been completed, learners should produce a cutting list for the tapered treads and part of the string forming the curvature. • Small group discussions on setting out principles and equipment learnt from activities, followed by whole group discussion **Resources:** • Activity 14: Learners to produce the setting out for the plan view and side elevations of the winder treads, newel post and strings. The sizes of the flight and the components can be adjusted to better fit in with the material available. The completed drawings should still represent realistic sections used in the construction of a domestic	

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
		staircase. • Activity 15: Leaners to set out the side elevations of the newel post. The sizes of the flight and components can be adjusted to better fit in with the material available. The completed drawings should still represent realistic sections used in the construction of a domestic staircase. • Activity 16: Learners to set out geometrical stairs to the specification provided, showing the curvature in plan for the three turning steps through 90°. The sizes of the flight and the components can be adjusted to better fit in with the material available. The completed drawings should still represent realistic sections used in the construction of a domestic staircase. • 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 • Winder treads specifications • Newel post specifications • Geometrical stair specifications • Drawing equipment • Setting out board	
Theory activities **Session 10** (3 hours)	**Learning outcome 2: Manufacture stairs with turns** **Topic 2.2: Component jointing methods used for turning stairs with newels**	**Activities:** • Recap on previous session • Tutor to outline construction methods used with turning stairs: – hand rails to newels	• Observation • Q&A • Activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
	Topic 2.3: Component jointing methods used for turning stairs with geometrical strings **Topic 2.4: Construct steps** **Topic 2.5: Construct handrails and balustrades** • Describe jointing methods used with: – newels – handrails – geometrical stairs • Describe entry steps	– winder treads – geometrical. • Tutor to describe housing joints for wall string jointing • Tutor to describe entry step profiles and construction methods • Learners to complete Activity 17 by identifying jointing process for cut strings • Learners to complete Activity 18 by identifying construction methods used with entry steps • Learners to complete Activity 19 by identifying methods used with wreathed string construction **Resources:** • Activity 17: Learners to: a) sketch the construction method used with cut, mitred and bracketed step construction; b) sketch the method used to attach the balusters with cut, mitred and bracketed construction • Activity 18: Learners to: a) name four common types of shaped steps; b) sketch the traditional construction method used with built-up bullnose steps; c) sketch the method used to attach a semi-circular step to the newel • Activity 19: Learners to: a) state three construction techniques used to build wreathed strings; b) with the aid of sketches, describe how staves should be produced when manufacturing built up strings; c) sketch the counter clamp method used to join the wreathed section of string to the straight section	

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
Practical activities **Sessions** **11 - 39** (3 hours)	**Learning outcome 2: Manufacture stairs with turns** **Learning outcome 3: Assemble stairs with turns** **Topic 2.4: Construct steps** **Topic 2.5: Construct handrails and balustrades** **Topic 3.1: Dry fitting and preparing surfaces** **Topic 3.2: Assemble stairs and carry out quality checks** • Produce turning stairs including: — winder tread stairs — geometrical stairs — cut and closed strings — shaped entry steps — balusters and handrailing • Select material, produce jigs and templates	**Session 11 to 39: practical workshop activities following relevant regulations and workshop rules, manufacture stairs with turns** **Activities:** • Recap on previous session • Follow relevant health and safety guidance • Mark out materials from setting out rods • Produce templates and formers • Produced stair components to from a range of turning stairs to include the following: — parallel steps — winder/tapered steps — straight and geometrical strings (closed and cut) — shaped bottom steps — continuous handrail to newels — curved to straight handrail — dry fit stairs — number joints — prepare surfaces for the intended surface finish — carry out relevant quality checks: square, wind, size. **Resources:** • Winder tread construction specification • Newel post construction specification	• Observation • Q&A • Practical activities

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Session	Objectives/learning outcomes **The learner will:**	Activities and resources	Assessment
		• Entry step construction specification • Geometrical stair construction specification • Selection of timber and timber based material • Appropriate woodworking machinery • Portable power tools • Hand tools • Video link to fitting newels: https://youtu.be/AUhN_qrUSnM • Video link to fitting winder treads: https://youtu.be/rgcKj0yBI8k	
Theory activity **Session 40** (3 hours)	**Learning outcome 1: Set out stairs with turns** **Learning outcome 2: Manufacture stairs with turns** **Learning outcome 3: Assemble stairs with turns** • Review of Unit 308	**Activities:** • Learners to review Unit 308 and complete multiple choice questions **Resources:** • Set of 20 end-of-unit multiple-choice test questions to check learners' understanding of the unit	• Observation • Q&A • End of unit questions

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