

# Woodwork syllabus

Every examinable topic area in WAEC Woodwork, in one place — with how the papers are structured and answers to common questions. Compiled by waeccbt.com; not an official WAEC document.

How the papers work: Three papers, all compulsory; Papers 1 and 2 are a composite paper taken at one sitting. Paper 1: 40 multiple-choice objective questions, 40 minutes, 40 marks. Paper 2: theory and design paper, 2 hours 20 minutes, in two sections — Section A is short structured questions in three parts (Part I for Ghana only; Part II for Nigeria, Sierra Leone and The Gambia; Part III for all candidates, two questions of which one is answered), and Section B is design and drawing questions answered in 1 hour 40 minutes for 40 marks. Paper 3: a 3-hour practical test in which candidates make a test piece from supplied drawings, 100 marks. Nigerian candidates also take Topic 29 (Entrepreneurship in Woodworking). This site's bank practises Paper 1 and the knowledge behind Papers 2 and 3.

## 1. Practical skills and joints (Paper 3)

- Common hand tools, portable power tools and basic machines
- Widening joints: plain butt, dowelled, tongued and grooved, rebated butt
- Angle joints: common and lapped dovetail, pin, housing, dowelled, plain mitre
- Framing joints: mortise and tenon, bridle, lapped, mitre, dowelled
- Cutting (ripping, cross-cutting), planing (surfacing, thicknessing), shaping (chamfering, rounding, tapering)
- Assembling and finishing: testing for squareness, diagonals, trial assembly, cramping, surface preparation, finishes

## 2. General workshop safety

- Personal safety precautions
- Workshop safety regulations
- Safety devices and appliances
- Hand tool safety: carrying, storing, handling
- Machine safety: guards, portable power tools, prevention of mechanical faults
- First aid: materials and administration

## 3. Hand tools and special-purpose tools

- Classification: geometrical, holding and supporting, impelling and percussion, cutting, boring, abrading and scraping tools
- Identification, description and sketching
- Special planes: spokeshave, rebate, plough, block, shoulder
- Special saws: bow, pad/keyhole, coping, fret
- Boring bits: expansion, Forstner, countersink, auger
- Shapers: scrapers, rasps, surforms

## 4. Portable power tools and woodworking machines

- Power drill, jig saw, spray gun, power screwdriver, sanders, router, power circular saw
- Circular saw, crosscut saw, thicknesser, surface planer, mortiser, lathe, grinding wheel, drilling machine
- Uses, care and safe use
- Guards, fences, push sticks, push blocks, gauges

## 5. Maintenance

- Corrective, routine, predictive and preventive maintenance
- Reasons for maintenance
- Maintenance of hand tools: oiling, sharpening, repairing, storing
- Maintenance of machines: cleaning, oiling, servicing, replacing parts

## 6. West African timbers

- Timber growth and structure; parts of a tree and their functions
- Classification: softwoods and hardwoods
- Common timbers: iroko (odum), abura, mahogany, obeche (wawa), African walnut, afara, ebony, danta, emery, shedua, mansonina, cedar, afrormosia (kokrodua), avodire, kusia
- Surface, working and mechanical qualities; specific uses

## 7. Timber conversion, seasoning, defects and preservation

- Conversion: plain/through-and-through, tangential/back/flat sawing, quarter/radial/rift sawing
- Market sizes: log, plank, scantling, board, batten, strip/lath, squares
- Seasoning: natural/open air, kiln, water and chemical; advantages and disadvantages
- Moisture content: moisture meter and oven-dry methods; percentage calculation
- Defects: natural growth, felling, conversion, seasoning, organisms; causes, prevention, remedies
- Preservation: reasons, common preservatives, properties of a good preservative, application by brushing, dipping, spraying

## 8. Manufactured boards, timber preparation and joints

- Plywood, blockboard, laminboard, chipboard, hardboard, MDF: structure, characteristics, uses
- Selection of tools and machines; operational sequence for hand and machine preparation
- Joint classification: widening, angle and framing joints; identification, sketching, construction and use

## 9. Finishes, abrasives, adhesives, fittings and non-wood materials

- Fillers, stains, paints, varnishes, lacquers, polishes; surface preparation; brushing, spraying, dipping
- Abrasive grades: coarse, medium, fine; selection and uses
- Adhesives: animal and casein glues; urea, phenol and melamine formaldehyde, epoxy, PVA; contact adhesives
- Fittings (hinges, locks, handles, bolts, catches) and fasteners (nails, screws, bolts and nuts, corrugated fasteners)
- Non-wood materials: glass, plastics, rubber, ceramics, metal, leather

## 10. Veneering, shaping, bending and surface decoration

- Veneer types and production; hammer and press veneering; veneer hammer, caul, cramps
- Shaping: rounding, moulding, bevelling, chamfering, tapering, carving
- Bending: solid and laminated; suitable woods
- Surface decoration: inlaying, veneering, marquetry, lamination, laminated plastics, mouldings

## 11. Design, drawing and project construction

- Concept of design; design fundamentals and process; freehand sketching
- Working drawings in first and third angle orthographic projection; sectional representation
- Cutting list and bill of materials; draughtsmanship
- Identifying and analysing design problems; designing; estimating cost; constructing and evaluating to specification

## 12. Upholstery, wood turning, carving and mass production

- Upholstery tools (needles, scissors, hammer, webbing stretcher, sewing and buttoning machines), materials and processes: framing, padding, covering, finishing
- Wood lathe parts and accessories; turning tools; faceplate turning, turning between centres, boring; suitable woods
- Carving: incised and relief; sculpture of simple ornaments; tools
- Mass production: market survey, design, production, quality assurance, marketing, costing, templates, fixtures, jigs, prototypes

## 13. Entrepreneurship in woodworking (Nigeria only)

- Business organisation: sole proprietorship, partnership, cooperatives
- Business opportunities: merchandising, spray painting, upholstery, wood turning
- Business plan format and content
- Sources of funds: gifts, personal savings, loans, inheritance, cooperatives; benefits and risks

## Frequently asked questions

### How many papers are there in WAEC Woodwork and how long is each?

Three papers, all compulsory. Paper 1 is 40 objective questions in 40 minutes (40 marks). Paper 2 is a theory and design paper of 2 hours 20 minutes with a structured Section A and a design-and-drawing Section B (40 marks, 1 hour 40 minutes). Paper 3 is a 3-hour practical test worth 100 marks in which you make a test piece from supplied drawings.

### Which part of Paper 2 Section A do Nigerian candidates answer?

Section A has three parts. Part I is for Ghana only, Part II is for candidates in Nigeria, Sierra Leone and The Gambia, and Part III is for everybody (two questions, answer one). A Nigerian candidate therefore works Part II and Part III.

### Is the entrepreneurship topic examinable for me?

Yes if you sit in Nigeria. Topic 29, Entrepreneurship in Woodworking (business organisation, opportunities, business plans and sources of funds), is marked "for candidates in Nigeria only" in the official syllabus.

**What joints must I be able to make in the practical?**

Widening joints (plain butt, dowelled, tongued and grooved, rebated butt), angle joints for box-like and shelf-like work (common and lapped dovetail, pin, housing, dowelled, plain mitre) and framing joints (mortise and tenon, bridle, lapped, mitre, dowelled). Practise marking out, sawing to a line and trial assembly under time.

**Which projection is used for working drawings?**

Working drawings are produced in first and third angle orthographic projection. You are expected to show correct sectional representation of materials, a cutting list and a bill of materials.

**Do I need to know the West African timbers by name?**

Yes. The syllabus lists iroko (odum), abura, mahogany, obeche (wawa), African walnut, afara, ebony, danta, emery, shedua, mansonina, cedar, afrormosia (kokrodua), avodire and kusia. Learn their classification (hardwood/softwood), working qualities and specific uses.

**How is moisture content of timber calculated?**

By the oven-dry method:  $\text{moisture content (\%)} = (\text{wet mass} - \text{oven-dry mass}) \div \text{oven-dry mass} \times 100$ . A moisture meter gives a direct reading. Expect calculation questions on this in Papers 1 and 2.

**Practise this syllabus free — timed CBT papers with instant marking:**  
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