

**Syllabus for Assistant Formwork Carpenter**

<b>Course Name</b>	<b>Assistant Formwork Carpenter</b>
<b>Course Code</b>	<b>CON/2023/ASFC/144</b>
<b>Sector</b>	<b>Construction</b>
<b>Level</b>	<b>3</b>
<b>Occupation</b>	<b>Carpenter Construction</b>
<b>Job Description</b>	<ol style="list-style-type: none"> <li>1. Make wooden shutter used in shuttering carpentry.</li> <li>2. Assemble &amp; dismantle Conventional &amp; System formwork for R.C.C structures like Raft, Column, Wall, Tie beam, Slab</li> <li>3. Erect and dismantle scaffold/staging.</li> <li>4. Steel frame plastic panel shuttering.</li> <li>5. Bolt Lift Column shuttering &amp; Checking.</li> </ol>
<b>Course Duration</b>	<b>Total Duration 390 Hrs (T-90, P-180, OJT-60 and ES-60)</b>
<b>Trainees' Entry Qualification</b>	Grade 10 OR Grade 8 with two year of (NTC/ NAC) after 8 <sup>th</sup> OR Grade 8 pass and pursuing continuous schooling in regular school with vocational subject OR 8th grade pass with 2 yrs relevant experience OR Previous relevant Qualification of NSQF Level 2 with one yr experience OR Previous relevant Qualification of NSQF Level 2.5 with 6 months experience
<b>Trainers Qualification</b>	BE/B. TECH in Civil Engineering / Construction Engineering with 1Yr experience OR Diploma in Civil Engineering with 2 Yrs experience. OR ITI in Mason Trade in Building construction with 3 Yrs experience.

**Structure of Course:**

<b>Module No.</b>	<b>Module name</b>	<b>Outcome</b>	<b>Theory (Hrs)</b>	<b>Practical (Hrs)</b>	<b>Total (Hrs) [Multiple of 30]</b>
1	<b>Introduction to Trade Safety</b>	Optimize productivity by following safe working practices.	10	20	30
2	<b>Tools Introduction</b>	Identify different types of Tools and their different uses.	10	20	<b>30</b>
3	<b>Construction Materials</b>	Identify different types of shuttering materials and Conventional/System Shuttering for different RCC structures.	10	20	30
4	<b>System Materials</b>	Identify different types of	10	20	30

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs) [Multiple of 30]
		Scaffolding/Staging materials and Conventional/System Scaffoldings for different RCC structures.			
5.	<b>Conventional &amp; System Shuttering</b>	Assemble and dismantle conventional & System Shuttering for different RCC structures including new technologies like – Plastic Formwork, Alufo Formwork, Nova Formwork & Koehpa Formwork etc.	50	100	150
6.	<b>OJT</b>			60	60
7.	<b>Employability Skill</b>		--	--	60
<b>TOTAL:</b>			90	240	390

**SYLLABUS:****Module No. 1: Introduction to Trade Safety****Outcome:**

Optimize productivity by following safe working practices.

**Theory Content:**

- 1.1 Formwork Carpentry Trade
- 1.2 Formwork Carpentry Trade Specific Safety
- 1.3 Transportation Safety
- 1.4 Loading & Unloading of Formwork Materials
- 1.5 Cutting of Plywood by manual
- 1.6 Cutting of Plywood by machine
- 1.7 Stacking of Formwork Materials
- 1.8 Safety for Height Work
- 1.9 Benefit of Housekeeping

**Practical Content:**

- 1.1 Identify and report any hazards, risks in site safety to the appropriate authorities.
- 1.2 Follow emergency and evacuation procedures in case of accidents, fires, natural calamities.
- 1.3 Electrical Safety: Selection and use of electrical fixtures to assemble & maintain temporary electrical panel for construction work.
- 1.4 Follow recommended safe practices in handling construction materials, including chemical and Hazardous material whenever applicable.
- 1.5 Use appropriate Personal Protective Equipment (PPE) as per work requirements including:
  - Head Protection (Helmets)

- Ear Protection
- Fall protection
- Foot protection
- Face and Eye Protection
- Hand and Body Protection
- Respiratory Protection (if required)

## Module No. 2: Tools Introduction

### Outcome:

Identify different types of Tools and their different uses.

### Theory Content:

- 2.1 What is Hand tools & Power Tools
- 2.2 Types of Hand tools & their use in shuttering carpentry work
- 2.3 Types of power tools & their use in shuttering carpentry work
- 2.4 Different types of Checking tools
- 2.5 Laser tools
- 2.6 Safety in using the Power tools

### Practical Content:

- 2.1 Hand tool's & Power Tool's Uses in Different Work
- 2.2 Use different types of Hand tools in shuttering carpentry work
- 2.3 Use different types of power tools in shuttering carpentry work
- 2.4 Safety in using the Power tools
- 2.5 Uses of Checking tools
- 2.6 Uses of Laser tools

## Module No. 3: Construction Materials

### Outcome:

Identify different types of shuttering materials and Conventional/System Shuttering for different RCC structures.

### Theory Content:

- 3.1 **Timber:** Characteristics of good timber, Preservation of timber, Uses, Alternative material to Timber, Size of Timber.
- 3.2 **Plywood:** Characteristics of good Plywood, Preservation of plywood, Alternative material to Plywood, Size, Types of Plywood, Uses.
- 3.3 **Consumables:** Different types of consumables materials.
- 3.4 **General abbreviations:**  
 RCC - Reinforced Cement Concrete  
 BWK - Brickwork  
 DRG - Drawing  
 FS - Full size  
 N.T.S - Not to scale.  
 FFL - Finished floor level

SFL - Structure floor level  
 EL - Existing level  
 HOR - Horizontal  
 VER - Vertical  
 DIA – Diameter  
 TOC- Top of Concrete  
 BOC- Bottom of Concrete

**Practical Content:**

- 3.1 Identification, Marking, Measuring the Timber.
- 3.2 Identification, Marking, Measuring, Cutting of different types of Ply & Drilling of Hole.
- 3.3 Identification, Marking & Measuring the different types of Timber Joint and uses of Drill Machine.
- 3.4 Making of conventional shutter by using Mechanized tools (Nailing M/C,Rivet Gun,Plastic Ply.)

**Module No. 4: System Materials**

**Outcome**

Identify different types of Scaffolding/Staging materials and Conventional/System Scaffoldings for different RCC structures.

**Theory Content:**

- 4.1 System Materials: Different types of Materials, Size, Uses & Different types of shutter system materials.
- 4.2 Scaffold materials: System scaffold different type of materials.
- 4.3 Pipe & Coupler: standard Length of Laser pipe, Lap length, Different types of Coupler, Uses.

**Practical Content:**

- 4.1 **Erection & Dismantling of System tower/Scaffolding:** Layout Marking, Uses of Materials/Component, Size, Height, Tie-up. Verticality.
- 4.2 **Stair Tower:** Technical name of different parts of a stair through models.
- 4.3 **Pipe & Coupler:** Size of Laser Pipe, Layout Marling, Size of Coupler, Pleasing of Runner and Bearer, Diagonal, Proper handrailing, Support, etc.
- 4.4 Estimation of quantity of materials and cost involvement.

**Module No. 5: Conventional & System shuttering**

**Outcome:**

Assemble and dismantle conventional & System Shuttering for different RCC structures including new technologies like – Plastic Formwork, Alufo Formwork, Nova Formwork & Koehpa Formwork etc.

**Theory Content:**

- 5.1 Assembling & dismantling Conventional & System formwork for R.C.C structures like Raft, Column, Wall, Tie beam, Slab.
- 5.2 Plastic formwork: Plastic Formwork Column, Wall & Insert Plate Fixing.

5.3 Bolt lift column: Different types of column shuttering with bolt fixing.

**Practical Content:**

5.1 Identification of System Formwork components

**5.2 Making System Straight Wall Shutter:** Distance between one timber to another timber, ply cutting & Sizing, Length, Berth, Diagonal, Height Checking.

**5.3 Assembling & Dismantling of conventional foundation form:** Different types of shallow foundation & deep foundation, Layout Marking, Estimate of Material/Component, Size, Level, Diagonal, No Gape, Proper Support, Alignment, etc.

**5.4 Assembling & Dismantling of System column form:** Different types of Columns, make Stater, Size of Plywood, Estimate needed materials/components, size, top of concrete level marking, no gape any joint, alignment, proper support, etc.

**5.5 Assembling & Dismantling of System wall form:** Different types of Wall, make Stater, Size of Plywood, Estimate needed materials/components, size, top of concrete level marking, no gape any joint, alignment, proper support, etc.

**5.6 Assembling & dismantling of System Tie Beam form:** Objectives, Layout marking, height calculation, Staging for Beam with maintain proper height, after erect Checking line of beam bottom, thickness of beam, no gape between two beam bottom, side shutter verticality, no gape between two side Shutter, level marking for TOC (Top of Concrete), etc.

**5.7 Assembling & dismantling of Beam & Slab form(conv.):** Objectives, Layout marking, height calculation, make beam out side shutter & in side shutter, Staging for Beam with maintain proper height, after erect Checking line of beam bottom, thickness of beam, no gape between two beam bottom, side shutter verticality, no gape between two side Shutter, level marking for TOC (Top of Concrete), etc.

**5.8 Assembling & dismantling of Beam & Slab form (Syst.):** Objectives, Layout marking, height calculation, make beam out side shutter & in side shutter, Staging for Beam with maintain proper height, after erect Checking line of beam bottom, thickness of beam, no gape between two beam bottom, side shutter verticality, no gape between two side Shutter, level marking for TOC (Top of Concrete), etc.

**5.9 Practice Bolt Lift Column. (Dia of Bolt 25mm ) Column Size- (600X600), (500X500), (300X300):** Objectives, uses different dia of bolt in different size of column, maintain proper level, center of bolt, verticality of bolt.

**5.10 Steel frame plastic panel shuttering like Raft, Column, Wall ,Slab**

**Module No. 6: Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT)**

**Outcome:**

Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain.

**Theory Content:**

**Practical Content:**

Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for 60 Hours.)

### **Module No. 7: Employability Skills**

#### *Key Learning Outcomes*

#### **Introduction to Employability Skills Duration: 1.5 Hours**

**After completing this programme, participants will be able to:**

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

#### **Constitutional values - Citizenship Duration: 1.5 Hours**

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

#### **Becoming a Professional in the 21st Century Duration: 2.5 Hours**

5. Discuss importance of relevant 21st century skills.
6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

#### **Basic English Skills Duration: 10 Hours**

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e -mail using basic English

#### **Career Development & Goal Setting Duration: 2 Hours**

11. Create a career development plan with well-defined short- and long-term goals

#### **Communication Skills Duration: 5 Hours**

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
13. Explain the importance of active listening for effective communication
14. Discuss the significance of working collaboratively with others in a team

#### **Diversity & Inclusion Duration: 2.5 Hours**

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
16. Discuss the significance of escalating sexual harassment issues as per POSH act.

## Financial and Legal Literacy Duration: 5 Hours

17. Outline the importance of selecting the right financial institution, product, and service
18. Demonstrate how to carry out offline and online financial transactions, safely and securely
19. List the common components of salary and compute income, expenditure, taxes, investments etc.
20. Discuss the legal rights, laws, and aids

## Essential Digital Skills Duration: 10 Hours

21. Describe the role of digital technology in today's life
22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
24. Create sample word documents, excel sheets and presentations using basic features
25. utilize virtual collaboration tools to work effectively

## Entrepreneurship Duration: 7 Hours

26. Explain the types of entrepreneurship and enterprises
27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
29. Create a sample business plan, for the selected business opportunity

## Customer Service Duration: 5 Hours

30. Describe the significance of analyzing different types and needs of customers
31. Explain the significance of identifying customer needs and responding to them in a professional manner.
32. Discuss the significance of maintaining hygiene and dressing appropriately

## Getting Ready for apprenticeship & Jobs Duration: 8 Hours

33. Create a professional Curriculum Vitae (CV)
34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
35. Discuss the significance of maintaining hygiene and confidence during an interview
36. Perform a mock interview
37. List the steps for searching and registering for apprenticeship opportunities

### Tools & Equipment needed:

Hand tools

1. Claw Hammer
2. Handsaw
3. Tenonsaw
4. Iron Jack Planner
5. Wooden Marking Gauge
6. Woden Mortise Gauge
7. Spirit Level
8. Tri-Square
9. Auger
10. Steel Measuring Tape

11. Farmer Chisel
12. Farmer Chisel
13. Mortise Chisel
14. Cutting Player
15. Screw Driver 10"
16. Marking Knife / Scribe
17. Wooden Mallet
18. Oil Stone (Rough / Smooth)
19. Center Punch
20. Bench Vice
21. Hacksaw Frame with blade
22. Triangle file -
23. Half Round File & Rasp cut file
24. Drill Bit
25. Plumb Bob
26. Ring Spanner
27. Double End Spanner
28. Screw Spanner 12" LM
29. Carpenter Working Table
30. Nail Bar

### **Power tools**

1. Handheld timber Cutting machine (Circular saw, Zig-jack saw)
2. Drilling machine
3. Table mounted circular saw
4. Planing machine

### **Mechanization tools**

1. Nail Gun Machine

### **Outcome**

Identify and use different types of tools in shuttering and carpentry work.



**Learning Outcome – Assessment Criteria**

Module No.	Outcome	Assessment Criteria
1	Optimize productivity by following safe working practices.	<ul style="list-style-type: none"> <li>▪ Understand about trade</li> <li>▪ New words &amp; activities about trade.</li> <li>▪ Identify EHS requirements.</li> <li>▪ Importance of Housekeeping</li> </ul> <ul style="list-style-type: none"> <li>• Identify and report any hazards, risks in site safety</li> <li>• Follow emergency and evacuation procedures in case of accidents, fires, natural calamities.</li> <li>• Select and use of electrical fixtures to assemble &amp; maintain temporary electrical panel for construction work.</li> <li>• Follow recommended safe practices in handling construction materials, including chemical and Hazardous material whenever applicable.</li> <li>• Use appropriate Personal Protective Equipment (PPE) as per work requirements including:               <ul style="list-style-type: none"> <li>• Head Protection (Helmets)</li> <li>• Ear Protection</li> <li>• Fall protection</li> <li>• Foot protection</li> <li>• Face and Eye Protection</li> <li>• Hand and Body Protection</li> <li>• Respiratory Protection (if required)</li> </ul> </li> </ul>
2	Identify different types of Tools and their different uses.	<ul style="list-style-type: none"> <li>• Use of Hand Tools &amp; Power Tools.</li> <li>• Handle materials carefully.</li> <li>• Use Mechanized Tools.</li> </ul>
3	Identify different types of shuttering materials and Conventional/System Shuttering for different RCC structures.	<ul style="list-style-type: none"> <li>• Identify, Mark &amp; Measure different types of Timber Joint and use Drill Machine</li> <li>• Identify, Mark, Measure &amp; Cut different types of Ply &amp; Drill Hole</li> </ul>
4	Identify different types of Scaffolding/Staging materials and Conventional/System Scaffoldings for different RCC structures.	<ul style="list-style-type: none"> <li>• Explain different types of system shuttering materials and their uses.</li> <li>• Define characteristics of good materials</li> <li>• Erect &amp; Dismantle System tower/Scaffolding.</li> <li>• Estimate the calculation of quantities. of materials required for different items of work and approximate cost involved</li> </ul>
5	Assemble and dismantle conventional & System Shuttering for different RCC structures including new technologies like – Plastic Formwork, Alufo Formwork, Nova Formwork & Koehpa Formwork etc.	<ul style="list-style-type: none"> <li>• Assemble &amp; Dismantle conventional foundation form</li> <li>• Assemble &amp; Dismantle System Foundation form, Column Form, Wall form, Beam &amp; slab form</li> </ul>

Module No.	Outcome	Assessment Criteria
		<ul style="list-style-type: none"> <li>• Steel frame plastic panel shuttering</li> <li>• Bolt lift column</li> </ul>
6	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain
7	Employability Skill	As per NCVET guided curriculum

### List of Tools, Equipment & materials needed for 30 Trainees (Practical)

Sl No	Items Name	Specification	Qty
1	<b><u>Hand tools</u></b> 1. Claw Hammer 2. Handsaw 3. Tenon saw 4. Iron Jack Planner 5. Wooden Marking Gauge 6. Wooden Mortise Gauge 7. Spirit Level 8. Tri-Square 9. Auger 10. Steel Measuring Tape 11. Farmer Chisel 12. Farmer Chisel 13. Mortise Chisel 14. Cutting Player 15. Screwdriver 10" 16. Marking Knife / Scribe 17. Wooden Mallet 18. Plumb Bob 19. Ring Spanner 20. Double End Spanner 21. Screw Spanner 12" LM 22. Carpenter Working Table 23. Nail Bar		10 nos each item
2	Consumables Materials: Nails-1",1.5",2",2.5"		5 kg
	Shuttering Oil		5 Ltr
4	Materials		
	Timber		20 cft

Sl No	Items Name	Specification	Qty
	Plywood		30 nos
	40 NB Ledger Pipes		20 nos
	Swivel coupler		50 nos
	Fixed coupler		50 nos
5	Power tools		
	Circular saw, Zig-jack saw		<b>2 nos</b>
	Drilling machine		1 no
	Table mounted circular saw		1 no
	Planning machine		1 no

### Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr marks
Optimize productivity by following safe working practices.	CON/0818/OC1	20	120
Identify different types of Tools and their different uses.	CON/0818/OC2	20	120
Identify different types of shuttering materials and Conventional/System Shuttering for different RCC structures.	CON/0818/OC3	20	120
Identify different types of Scaffolding/Staging materials and Conventional/System Scaffoldings for different RCC structures.	CON/0818/OC4	20	120
Assemble and dismantle conventional & System Shuttering for different RCC structures including new technologies like – Plastic Formwork, Alufo Formwork, Nova Formwork & Koehpa Formwork etc.	CON/0818/OC5	70	170
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	CON/0818/OC6	0	150
Employability Skill-60 Hrs	DGT/VSQ/N0102	50	0