



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

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COURSE BROCHURE

Rework and Repair of Electronic Assemblies

Physical, Mathematical, Computer and Life Sciences / Information Technology and Computer Sciences

Unit Standard 259166 · NQF Level 5 · 15 Credits · 12 Days

COURSE OVERVIEW

This course equips learners with the skills to rework and repair electronic assemblies to industry standards. It covers the identification of defects, selection of appropriate tools and techniques, and the application of safe soldering and desoldering practices. By the end, participants will be able to restore electronic assemblies to functional and reliable condition.

Category	Physical, Mathematical, Computer and Life Sciences
Subfield	Information Technology and Computer Sciences
Unit Standard	259166
Accreditation	SAQA Accredited · NQF Level 5 · 15 Credits
Duration	12 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Identify and classify common defects in electronic assemblies using visual inspection and testing equipment.
- Apply correct desoldering and soldering techniques to remove and replace through-hole and surface-mount components without damaging the board.
- Select and use appropriate tools, materials, and safety equipment for rework and repair tasks.
- Demonstrate adherence to electrostatic discharge (ESD) prevention and workplace safety procedures during rework operations.
- Evaluate the quality of rework and repair work against IPC or equivalent industry standards.
- Document repair actions and outcomes in accordance with company quality procedures.

WHO SHOULD ATTEND

- This course is designed for electronics technicians, assembly workers, and maintenance personnel who are responsible for repairing and reworking printed circuit boards and electronic assemblies in a manufacturing or service environment.

COURSE OUTLINE

Day 1: Introduction to Rework and Repair Standards

- Overview of rework vs repair vs modification
- Applicable standards: IPC-7711/7721, SAQA 259166
- ESD control and safe work practices
- Documentation: work orders, repair logs, quality records
- Introduction to tools and equipment
- Material identification: solder alloys, fluxes, conformal coatings

Day 2: Soldering Fundamentals and Inspection

- Solder iron types, tips, temperature settings
- Flux and solder wire selection
- Through-hole soldering techniques
- Desoldering methods: wick, vacuum pump, hot air
- Solder joint defects: cold joints, bridges, insufficient wetting
- Inspection criteria for through-hole and surface mount

Day 3: Surface Mount Technology (SMT) Basics

- SMT package types: chip, SOIC, QFP, BGA
- Manual pick and place techniques
- Hot air rework station operation
- Solder paste application and reflow
- Inspection using microscope and X-ray (principles)
- Common SMT defects: tombstoning, skewing, opens

Day 4: Through-Hole Rework and Repair

- Desoldering large multi-pin components
- PTH repair using eyelets and conductive epoxy
- Connector replacement methods
- Heat sinks and thermal relief
- Replacing switches, potentiometers, transformers
- Post-repair inspection and testing

Day 5: Conformal Coating and Underfill

- Conformal coating types: acrylic, urethane, silicone, parylene
- Application methods: brush, spray, dip
- Coating removal: chemical, mechanical, laser
- Underfill materials and dispensing
- Curing processes
- Inspection for bubbles, delamination, thickness

Day 6: BGA and Fine Pitch Rework

- BGA rework equipment: preheaters, top heaters, profiling
- Solder ball attachment and reballing
- Flux application and cleaning
- Alignment and placement techniques
- X-ray inspection principles

- Dye penetration testing for cracks

Day 7: Conductor Repair and Lifting

- Pad repair using epoxy and copper foil
- Trace repair with conductive ink or wire
- Jumper wire routing and strain relief
- Laminate repair for delamination
- Conductive adhesive selection and curing
- Insulation and coating after repair

Day 8: Component Damage and Replacement Strategies

- Damage assessment criteria
- IC removal and replacement techniques
- Connector pin replacement
- MSD handling and baking
- Cleaning solvents and methods: ultrasonic, spray, manual
- Residue inspection and cleanliness testing

Day 9: Advanced Rework for Hybrid and High-Reliability Assemblies

- Hybrid circuit rework: wire bonding, die attachment
- RF component handling: impedance control
- Flex circuit repair: reinforcement, adhesive bonding
- Rigid-flex separation repair
- Hermetic sealing and leak testing
- High-reliability soldering: controlled atmospheres

Day 10: Quality Control and Process Validation

- Procedure writing and work instructions
- First article inspection checklist
- SPC for rework processes: defect tracking
- Failure analysis techniques: microscopy, cross-sectioning
- Root cause analysis tools: fishbone, 5 whys
- Corrective and preventive actions (CAPA)

Day 11: Health, Safety, and Environmental Compliance

- OHS Act and relevant regulations
- Material Safety Data Sheets (MSDS)
- Ventilation and fume extraction
- Lead-free soldering compliance
- Waste disposal: solder dross, chemicals, packaging
- Environmental management systems

Day 12: Final Assessment and Practical Integration

- Integrated repair project: multiple defects on test board
- Written examination covering standards, theory, and safety
- Practical assessment: BGA rework, trace repair, coating removal
- Review of common mistakes and troubleshooting
- Certification process and continuing education
- Course evaluation and feedback

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **15 NQF credits** at **NQF Level 5**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 43,000.00	R 43,000.00
1	In-House	R 56,000.00	R 56,000.00
1	On-Campus (Pretoria)	R 64,600.00	R 64,600.00

UPCOMING SESSIONS

No sessions are currently scheduled. Please contact us to arrange a session at a time and location that suits your team.

HOW TO GET A QUOTE OR APPLY

1. **Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard 259166) and click **Get A Quote / Apply**. Select your training method and number of delegates – your quotation is generated immediately and emailed to you with the course brochure attached.
2. **Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to apply@aaticd.co.za – our team will reply with a formal quotation.
3. **Apply by phone or WhatsApp:** call **+27 12 004 8389** or WhatsApp **+27 65 077 6310** and we will prepare your quotation and reserve your seats.
4. **Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically – the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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