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

Basic Digital Electronics Principles

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

Unit Standard 259139 · NQF Level 4 · 10 Credits · 7 Days

COURSE OVERVIEW

This course provides learners with a foundational understanding of digital electronic principles, enabling them to interpret and construct basic digital circuits. It covers number systems, logic gates, Boolean algebra, and simple combinational logic, preparing participants for further study or entry-level work in electronics and IT.

Category	Physical, Mathematical, Computer and Life Sciences
Subfield	Information Technology and Computer Sciences
Unit Standard	259139
Accreditation	SAQA Accredited · NQF Level 4 · 10 Credits
Duration	7 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS — verifiable online

LEARNING OUTCOMES

- Apply number systems (binary, octal, hexadecimal) and conversions in digital circuits.
- Analyze and simplify Boolean expressions using Boolean algebra and Karnaugh maps.
- Demonstrate the operation of basic logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR) and their truth tables.
- Design simple combinational logic circuits to meet given specifications.
- Implement digital circuits using integrated circuits (ICs) on a breadboard or simulation software.
- Evaluate the functionality of a basic digital circuit through testing and troubleshooting.

WHO SHOULD ATTEND

- This course is ideal for technicians, engineers, and enthusiasts new to digital electronics, as well as IT professionals seeking to understand hardware fundamentals.

COURSE OUTLINE

Day 1: Introduction to Digital Electronics

- Analogue vs digital signals
- Overview of digital electronics applications
- Binary, octal, decimal, and hexadecimal number systems
- Conversion between number systems
- Introduction to logic families (TTL, CMOS
- Voltage levels and noise margins

Day 2: Logic Gates and Boolean Algebra

- Basic logic gates: AND, OR, NOT, NAND, NOR, XOR, XNOR
- Truth tables for each gate
- Boolean algebra laws and theorems
- De Morgan's theorems
- Simplification of logic expressions
- Introduction to Karnaugh maps (K-maps

Day 3: Combinational Logic Circuits

- Half adders and full adders
- Ripple carry adders
- Multiplexers (MUX) and demultiplexers (DEMUX
- Encoders and decoders
- Seven-segment display drivers
- K-map simplification for multiple outputs

Day 4: Sequential Logic Circuits - Flip-Flops and Registers

- SR, D, JK, and T flip-flops
- Edge-triggered vs level-triggered
- Clock signals and timing diagrams
- Registers and shift registers
- Asynchronous and synchronous counters
- Modulo-n counters

Day 5: Advanced Sequential Circuits and Memory

- Synchronous counter design
- State diagrams and state tables
- Finite state machine (FSM) design
- ROM, RAM, and programmable logic devices
- Read-only memory (ROM) basics
- Introduction to programmable logic arrays (PLA

Day 6: Digital Integrated Circuits and Interfacing

- IC packages (DIP, SOIC, etc.
- Datasheet interpretation
- Logic family interfacing (TTL to CMOS, etc.
- Fan-out and fan-in
- Noise immunity and decoupling capacitors

- Practical considerations: breadboarding and soldering

Day 7: **Project Integration and Troubleshooting**

- Project: digital lock or simple counter system
- Design and simulation using software tools
- Breadboard assembly and testing
- Troubleshooting with multimeters and logic probes
- ESD safety and handling
- Project presentation and review

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 **10 NQF credits** at **NQF Level 4**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 20,700.00	**R 20,700.00**
1	In-House	R 26,900.00	**R 26,900.00**
1	On-Campus (Pretoria)	R 31,000.00	**R 31,000.00**

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 259139) 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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