



## 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

# Matrices for Cartesian Transformations and Network Graphs

Physical, Mathematical, Computer and Life Sciences / Mathematical Sciences

Unit Standard 243836 · NQF Level 4 · 2 Credits · 1 Day

## COURSE OVERVIEW

This course equips learners with the skills to use matrices for Cartesian transformations and graph theory to solve network problems. Participants will apply linear algebra concepts to perform rotations, reflections, and scaling in the Cartesian plane, and use adjacency matrices to analyze network connectivity and flow.

|                 |                                                    |
|-----------------|----------------------------------------------------|
| Category        | Physical, Mathematical, Computer and Life Sciences |
| Subfield        | Mathematical Sciences                              |
| Unit Standard   | 243836                                             |
| Accreditation   | SAQA Accredited · NQF Level 4 · 2 Credits          |
| Duration        | 1 day                                              |
| Training Method | Online, On-Campus, In-House                        |
| Certificate     | Issued via AATICD LMS – verifiable online          |

## LEARNING OUTCOMES

- Apply matrix operations to perform transformations (rotation, reflection, scaling) in the Cartesian plane.
- Analyze the effect of composite transformations by multiplying transformation matrices.
- Construct adjacency and incidence matrices to represent network graphs.
- Evaluate shortest paths and connectivity in networks using matrix methods.
- Demonstrate the use of matrices to solve real-world network problems, such as traffic flow or communication networks.

## WHO SHOULD ATTEND

- This course is ideal for data analysts, software developers, engineers, and students in mathematics or computer science who need practical skills in matrix applications for graphics and network analysis.

## COURSE OUTLINE

### Day 1: Matrices for Cartesian Transformations and Network Graphs

- Review of matrices: notation, addition, multiplication, identity, inverse.
- Cartesian coordinate system and homogeneous coordinates.
- 2D transformations: translation, rotation, scaling, and shearing using matrices.
- Composition of transformations and matrix multiplication order.
- Introduction to network graphs: vertices, edges, degrees.
- Adjacency matrices for directed and undirected graphs.
- Paths, connectivity, and powers of adjacency matrices.
- Applications: shortest paths, graph centrality, and transformation sequences.

## 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 **2 NQF credits** at **NQF Level 4**.

## PRICING (PER DELEGATE, EX-VAT)

| Delegates | Training Method      | Price per Delegate | Total       |
|-----------|----------------------|--------------------|-------------|
| 1         | Online               | R 12,800.00        | R 12,800.00 |
| 1         | In-House             | R 16,600.00        | R 16,600.00 |
| 1         | On-Campus (Pretoria) | R 19,200.00        | R 19,200.00 |

## UPCOMING SESSIONS

| Start       | End         | Method    | Venue                      |
|-------------|-------------|-----------|----------------------------|
| 05 Aug 2026 | 05 Aug 2026 | On-Campus | Dubai, UAE                 |
| 05 Aug 2026 | 05 Aug 2026 | On-Campus | Johannesburg, South Africa |
| 06 Aug 2026 | 06 Aug 2026 | On-Campus | Pretoria, South Africa     |
| 06 Aug 2026 | 06 Aug 2026 | On-Campus | Mauritius                  |
| 11 Aug 2026 | 11 Aug 2026 | On-Campus | Pretoria, South Africa     |
| 11 Aug 2026 | 11 Aug 2026 | On-Campus | Mauritius                  |
| 13 Aug 2026 | 13 Aug 2026 | On-Campus | Abu Dhabi, UAE             |
| 13 Aug 2026 | 13 Aug 2026 | On-Campus | Cape Town, South Africa    |

Contact us if no suitable date is listed – on-demand sessions can be arranged for groups.

## HOW TO GET A QUOTE OR APPLY

1. **Get an instant quotation online:** visit [www.aaticd.co.za](http://www.aaticd.co.za), open the page for this course (Unit Standard 243836) 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](mailto: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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