



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

Derivatives of Functions and Their Applications

Physical, Mathematical, Computer and Life Sciences / Mathematical Sciences

Unit Standard 243841 · NQF Level 3 · 6 Credits · 3 Days

COURSE OVERVIEW

This course equips learners with the skills to find derivatives of a range of functions, including polynomial, exponential, logarithmic, and trigonometric functions, and apply these techniques to solve real-world problems. Learners will develop the ability to analyze and interpret rates of change, optimize functions, and model dynamic systems, enhancing their analytical and problem-solving capabilities in technical and business contexts.

Category	Physical, Mathematical, Computer and Life Sciences
Subfield	Mathematical Sciences
Unit Standard	243841
Accreditation	SAQA Accredited · NQF Level 3 · 6 Credits
Duration	3 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Apply differentiation rules to find derivatives of polynomial, exponential, logarithmic, and trigonometric functions.
- Analyze functions using derivatives to determine critical points, intervals of increase/decrease, and concavity.
- Evaluate real-world problems involving rates of change, such as velocity and acceleration, using derivatives.
- Implement optimization techniques to solve problems involving maxima and minima in business and engineering contexts.
- Demonstrate the use of derivatives in modeling and interpreting dynamic systems.
- Apply the chain rule, product rule, and quotient rule to differentiate composite, product, and quotient functions.

WHO SHOULD ATTEND

- This course is designed for professionals, technicians, and students in engineering, finance, data science, and related fields who need to apply calculus concepts to solve practical problems.
- It is also suitable for anyone seeking to strengthen their mathematical foundation for further study or career advancement.

COURSE OUTLINE

Day 1: Foundations of Differentiation

- Introduction to limits and continuity.
- Definition of the derivative and its geometric interpretation (slope of tangent).
- Differentiation from first principles.
- Basic differentiation rules: constant, power, constant multiple, sum/difference.
- Differentiating polynomial functions.
- Examples and exercises on basic differentiation.

Day 2: Advanced Differentiation Techniques

- Product rule and quotient rule.
- Chain rule for composite functions.
- Derivatives of exponential and logarithmic functions.
- Derivatives of trigonometric functions (sin, cos, tan).
- Implicit differentiation.
- Higher-order derivatives.
- Examples and exercises on advanced techniques.

Day 3: Applications of Derivatives

- Rates of change in science and engineering.
- Increasing and decreasing functions; first derivative test.
- Concavity and points of inflection; second derivative test.
- Optimization problems (maxima and minima).
- Marginal cost, revenue, and profit in economics.
- Related rates problems.
- Summary 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 **6 NQF credits** at **NQF Level 3**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 17,900.00	R 17,900.00
1	In-House	R 23,300.00	R 23,300.00
1	On-Campus (Pretoria)	R 26,800.00	R 26,800.00

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 243841) 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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