

Module 2: Astronomy & Geology



Certification

Graduates receive DTA Short Course Certificate (upon completion of full program)



Duration

3 days (24 hours)

Course Description

This immersive module provides field guides with a foundational understanding of the celestial sphere and the terrestrial world. The astronomy component explores the universe's origins, celestial navigation, and Southern Hemisphere constellations, empowering guides to conduct captivating night sky presentations. The geology segment covers Earth's formation, rock cycles, and the unique geological forces that shaped Botswana's iconic landscapes, from the Okavango Delta to the Kalahari. The course integrates practical field interpretation skills with scientific principles, fostering a holistic understanding of the natural environment.

Course Outcome

Astronomy Course Outcomes:

- How to explain the origin of the universe and the evidence for its expansion.
- How to classify stars and describe their lifecycles, from nebulae to supernovae.
- How to identify and locate key constellations, asterisms, and deep-sky objects (LMC, SMC, Orion, Crux) visible from the Southern Hemisphere.
- How to use the Southern Cross and pointers to locate celestial south for navigation.
- How to articulate the cultural myths and practical significance of major constellations.
- How to conduct an engaging and informative astronomy presentation for guests.

Geology Course Outcomes:

- How to understand the formation of Earth and the ongoing processes of plate tectonics.
- How to classify the three main rock types (igneous, sedimentary, metamorphic) and explain their formation.
- How to interpret landscapes by understanding weathering, erosion, and deposition.
- How to read sedimentary layers to unravel past environmental conditions.
- How to explain the geological history and formation of key Botswana features: the Okavango Delta, Makgadikgadi Pans, Kalahari Desert, and Tsodilo Hills.
- How to describe soil as a living ecosystem and the role of the soil food web.

Topics Covered

Astronomy:

- The Origin of the Universe: Big Bang Theory & Redshift Galaxies, Nebulae, and Star Lifecycles
- The Solar System: Planets, Moons, and Celestial Mechanics
- Constellations & Star Maps of the Southern Hemisphere
- Cultural Mythology of the Night Sky
- Practical Navigation Using the Southern Cross
- Conducting Night Sky Presentations

Geology:

- The Formation of Earth and Plate Tectonics
- Rock Cycle and Basic Rock Classification (Igneous, Sedimentary, Metamorphic)
- Weathering, Erosion, Deposition, and Sedimentation
- Reading the Landscape: Interpreting Geological Histories
- The Geology of Botswana
- Introduction to Soil Biology and the Soil Food Web



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