

Introduction to Cultural Information Science: Where Information Technology Began

Welcome to this course on Cultural Information Science. Before we dive into practical IT skills and certification preparation, let me set the stage for understanding information technology from its true origins.

The African Roots of Information Technology

When most people think about the history of computing and information technology, they imagine a story beginning in 20th century America or Europe. But the foundations of information science—the mathematical thinking, symbolic systems, and computational approaches that make modern IT possible—stretch back tens of thousands of years to the African continent.

From Stone Age Innovation to Iron Age Engineering

The Later Stone Age transition, occurring first in eastern Africa between 50,000 and 39,000 years ago, marked a period when African peoples and their technologies spread across the globe. This included not just tools and techniques, but **conceptual frameworks**—ways of thinking about numbers, patterns, and systematic problem-solving.

The **Lebombo Bone**, discovered in the mountains between South Africa and Eswatini, represents the oldest known mathematical artifact, dating back approximately 40,000 years. This notched baboon fibula demonstrates early humans using systematic marks to track, calculate, and communicate numerical information. The **Ishango Bone** from the Congo region, roughly 20,000 years old, shows even more sophisticated mathematical thinking—potentially including prime number sequences and lunar calendar tracking.

These weren't primitive scratches. They were **information storage and processing systems**—the conceptual ancestors of every database, spreadsheet, and algorithm we use today.

The Spread of African Knowledge Systems

The technological sophistication of African peoples continued to develop in ways that directly parallel modern technological expansion. Recent archaeological evidence has pushed back the origins of African iron metallurgy significantly, with findings at Lejja in Nigeria dated to 2631-2458 BCE, at Obui in Central African Republic to 2136-1921 BCE, and sites like Balimbé, Bétumé, and Bouboun showing iron production activities as early as 3000-2500 BCE.

Why does metallurgy matter for an IT course? Because **material science is information science**. Smelting iron requires understanding temperature, timing, chemical reactions, and reproducible processes—essentially programming matter itself. These early engineers developed systematic knowledge that had to be precisely transmitted across generations, creating some of humanity's first technical documentation and knowledge management systems.

With the origin of the Greek alphabet (based on earlier Phonetic script), these transmission pathways carried mathematical and symbolic knowledge from Africa into the Mediterranean world, where they became foundational to what we now call "Western" science and philosophy. The binary number system used in every computer today traces documented origins to Egyptian mathematical texts from approximately 2400 BCE.

What This Course Covers

This four-hour introduction connects these ancient information science traditions directly to the practical IT skills you need for industry certifications and real-world technical work.

[Hour 1](#) establishes foundations—what information actually is, how the OSCI (Olokun Symbolism and Cosmological Infinity) framework helps us understand modern IT concepts, and hands-on hardware basics.

[Hour 2](#) explores mathematical foundations through ethnomathematics—Ron Eglash's work on African fractals, James Gates' discovery of Adinkra symbol structures in supersymmetry equations, and Philip Emeagwali's parallel processing innovations—alongside practical programming and troubleshooting skills.

[Hour 3](#) addresses knowledge management, database architecture, and how traditional African approaches to multidimensional information organization anticipate modern tensor processing, graph databases, and parallel computing architectures.

[Hour 4](#) brings everything together with communication systems theory, certification pathways (CompTIA A+, Network+, Security+), and practical troubleshooting scenarios.

The Core Insight

Information Technology is not something foreign to African peoples that must be learned from elsewhere. It is a **continuation of millennia of African innovation** in information science. When you understand binary logic, you're working with mathematical principles first developed in Africa. When you troubleshoot network architecture, you're applying systematic thinking that African engineers refined over thousands of years.

This isn't about replacing technical knowledge with cultural history. It's about **deepening your technical understanding** by connecting it to its true foundations. Students who understand *why* systems work—who grasp the underlying physics and logic—consistently outperform those who only memorize procedures.

Let's begin.

Hour 1: Information Technology

This is not a media studies class. This is not a cultural anthropology course.

This is a *science* course.

[KRS ONE on Information Technology 1996](#)

What is Information Technology (IT)?

If you're anything like me you find IT fascinating. IT can control things, move objects, turn devices on or off, and send signals around the globe.

At its most fundamental level IT encompasses the use of systems and tools to store, process, and exchange information. Notice how that sentence didn't really answer the question? It answers what IT *encompasses*, and why it might be used but it doesn't describe what IT *is*. This gets at the very heart of culture and the nature of information science itself.

IT is not any one device or tool. Information¹ is an abstract concept that refers to something which has the power to inform. People have the power to inform. Nature has the power to inform. And for thousands of years human beings have perceived, conceptualized, processed, stored and transmitted information through the manipulation of material sciences- **Information Science (IS)**.

The earliest recorded usage of information technology (e.g. using computational mathematics to communicate information) dates as far back as 40,000 years to the design and use of the Lebombo² and Ishango bones of South Africa.

What is Cultural Information Science (CIS)?

Cultural Information Science is a field that explores cultural knowledge as a form of information. It usually emphasizes the transmission of culture through social channels. However, in this course we will be focusing on how culture is used as a source of information technology.

This course offers an introduction to Information Science, Physics and Technology through an African Centered Education (**ACE**) STEM model. During the class we will align IT best practices, information models and frameworks with their analogous Indigenous Knowledge Systems (**IKS**) allowing for a deeper and more fundamental understanding of modern IT.

¹ Information: [Definition](#)

² [Lebombo Bone](#) – “oldest mathematical artifact”

Course History

CIS traces its roots back to the work of Dr. Elmer Imes³, the first physicist to develop and teach a "Cultural Physics" course in the United States.

Imes, the second African American to earn a physics Ph.D., joined the faculty at Fisk University in 1929, where he helped develop the physics department and implemented this innovative approach to physics education. Cultural Physics was an educational initiative developed by Imes to connect the scientific principles of physics with historical and cultural perspectives, well ahead of its time.

Ethnocomputing and Indigenous Information-Knowledge Systems (IIS/IKS)

Ethnocomputing is a field of study that explores the relationship between computing and culture. The binary number system used in IT traces its origins back to Africa. Early forms of the number system can be found in documents dating back to the fifth dynasty of Egypt (approx. 2400 BC⁴). The computer science principle of 'loose coupling' (modularity, scalability and adaptability in large systems) is represented in the selfsame fractal steganography of Adinkra symbols.

Dr. James Gates of the University of Maryland in 2010 attested to the discovery of 'computer code' in theoretical physics equations used to describe the nature of reality and co-developed an information set of [Adinkra Symbols](#) to visualize these representations. Adinkra Symbols were developed by the Akan people of Ghana to store and transmit knowledge of the "underlying geometric forms common to living organisms".⁵

In this course we will connect foundational IT concepts with (primarily West and Central African) **Indigenous Knowledge Systems (IKS)**. Tapping into the indigenous knowledge source of information technology makes technical IT concepts easier to understand and reinforces a functional comprehension of physics.

Olokun Symbolism and Cosmological Infinity⁶ (OSCI)

A new old way of seeing modern technology: African peoples across the continent developed the earliest examples of information technology (e.g. math, language, expert (divination) systems etc.) They used these conceptual tools to preserve and communicate their knowledge. Their understanding of material science is displayed in the evidence of the work they left behind. When we follow the themes found in many African cultures we find an understanding of symmetry, doubling, coupling and what physicist Jacob Barandes refers to as the "indivisible stochastic" (fluidic, probabilistic) nature of material physics.

Researcher Oluwatoyin Adepoju⁷ refers to this cosmological view as **Olokun Symbolism (OS)**: a set of cognitive processes and systems that describe/prescribe both our interaction with and observation of nature.

At the most fundamental level, IS/IT pertains to the interpretation of that which may be perceived/received. This means tuning in to your innate inner intelligence: The Perceiver. The inner "I" at the heart of IT.

This 4-hour IT course introduces you to this OSCI model with a focus on gaining practical IT certification and problem-solving skills.

³ [Elmer Samuel Imes Ph.D.](#)

⁴ [History of the binary number system](#)

⁵ [Ethnocomputing in Ghana - 2015](#)

⁶ [Olokun Symbolism and cosmological Infinity](#)

⁷ Founder, Director at Compicros : [Comparative Cognitive Processes and Systems](#)

- **Practical IT Skills Session:**
 - [IT x Numbers](#): Computer hardware basics
 - Setting up networks with awareness of physical space (drawing parallels to indigenous spatial awareness)
 - Hands-on exercise: Basic system diagnostics

Hour 2: Mathematical Foundations: Ethnocomputing

- **Ethnomathematics and Computing:**
 - Prof. Ron Eglash's work on African fractals and computing
 - [James Sylvester Gates – Superstring Theory](#)
- **Cultural Approaches to Problem-Solving:**
 - Dr. Elmer Imes' contributions to physics and measurement
 - [Phillip Emeagwali Connection Machine application](#)
- **Practical IT Skills Session:**
 - Basic programming concepts
 - Logical troubleshooting methodologies
 - CompTIA+ Troubleshooting Model

Hour 3: Knowledge Management and Information Systems

- **Knowledge Organization Across Cultures:**
 - [The African “Occult” origins of modern Cryptography](#)
 - [Patipembas, Veve, and Adinkras as Physics Diagrams](#)
- **Modern Information Architecture: $\oplus$**
 - [Database Fundamentals](#)

The **Grid**, or in 2D contexts **Table**, is a fundamental computational architecture principle that spans multiple domains. We use the **Konde Grid** of Mandombe as a conceptual tool to understand how **multidimensional relationship tracking** works across various technologies:

Graph Databases & Metric Tensors: (Neo4j, Amazon Neptune)

- **Nodes & Edges** = tensor components with directional relationships
- **Traversals** = tensor operations across multiple dimensions simultaneously
- **Path calculations** = metric tensor computations (distance/relationship strength)

○ Most Modern Databases are 2-Dimensional

Two dimensional databases have 2 axes: rows and columns. Therefore in most modern database implementations (SQL, Oracle, Pivot Tables etc.) running totals are **unidirectional** - they calculate sequentially along one axis (either down rows OR across columns), but not both at the same time. You cannot simultaneously show: running totals down each column & running totals across each row.

○ 3+ Dimensional Data Modeling

When the data model is shifted to a 3-dimensional perspective several relationships can be tracked simultaneously, similar to the relationships present in a multidimensional **tensor field** or [hypercube](#).

• TPU/GPU Architecture

○ **Tensor Processing Units** are literally designed for this:

Matrix operations = tensor calculations at hardware level

Parallel processing = simultaneous multidimensional computations

Memory architecture = optimized for tensor data structures

○ **Graphics Processing**

Each pixel position = tensor coordinate

Color, depth, lighting = tensor components

Real-time rendering = massive parallel tensor operations

○ **Crypto Mining & Machine Learning**

Hash calculations = tensor operations on block data

Parallel nonce testing = multidimensional search space

Network consensus = distributed tensor computation

○ **Machine Learning:**

Neural networks = chains of tensor transformations

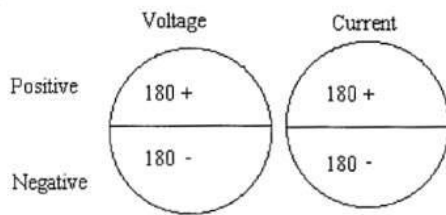
Weight matrices = learned metric tensors

Gradient descent = navigating multidimensional loss landscapes

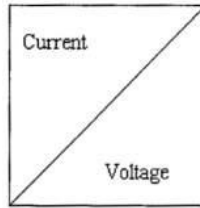
The Key Insight

Standard database models are essentially 2D projections of potentially multidimensional data relationships.

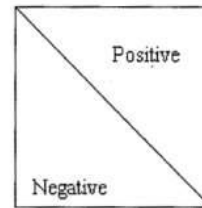
Cross JOIN SQL: Cartesian Product [Dikenga Cross]



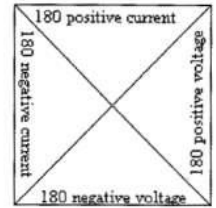
Example 5a: Both cycles of voltage and current. 2 circles 360° each (720 degrees)



Example 5b: The square is divided once for the two cycles involved (voltage & current)



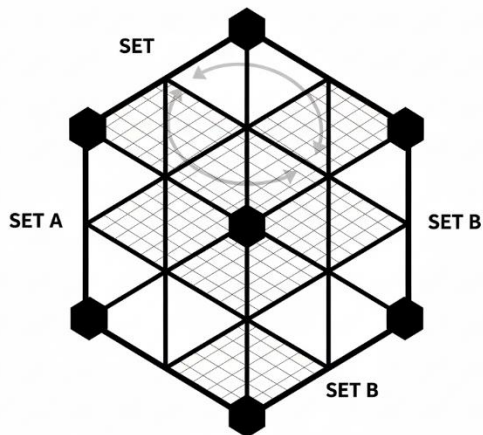
And again for the properties present in both (positive & negative)



Example 5c: Equaling 1 square with 4 areas of 180 degrees each. (720 degrees)

Example taken from "A Khemetic Understanding of Computers", p11 (MAAF Communications Group, [1998](#))

Modern computational systems solve this through:



MANDOMBE KONDE GRID (3D)
GEOMETRIC FOUNDATION + CYCLIC PATHS

1. **Parallel processing architectures**
(see [Philip Emeagwali: Connection Machine](#))
2. **Graph-based data structures**
3. **Tensor computation frameworks**
4. **Distributed processing networks**

The "one axis at a time" constraint is a relic of simpler computational models, while advanced OS systems can track relationships across multiple dimensions simultaneously - exactly like the metric tensors in spacetime physics.

This is why data scientists increasingly use tools like TensorFlow, PyTorch, or Graph databases instead of traditional spreadsheet pivot tables for complex analysis.

- **Practical IT Skills Session:**
 - SQL Query structure
 - Spreadsheets vs. Tables
 - "Entity" Relationships

Hour 4: Communication Systems and Certification Preparation

- **Communication Models:**
 - Indigenous communication systems and knowledge transfer
 - Shannon's communication model
- **IT Industry Certifications Overview:**
 - CompTIA A+, Network+, Security+ certification paths
 - Microsoft, Cisco, and cloud certification options
- **Practical IT Skills Session:**
 - Remote support techniques
 - Documentation best practices
 - Final hands-on exercise: Troubleshooting scenario integrating course concepts
 - Resources for continuing education and certification preparation

Assessment Methods

- Practical troubleshooting scenarios
- Concept mapping between cultural knowledge systems and IT concepts
- Hands-on technical skills demonstration
- Problem-solving approach documentation
- EBAPS

This course structure maintains focus on developing practical IT skills required for industry certifications while contextualizing technical concepts through OS knowledge systems, potentially making them more accessible to students from African backgrounds.