

NEW



SAICE Academy Elementary Construction Materials Course

3,0 CPD POINTS

SAICEEL26/04446/29

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Presented By: SAICE Volunteers
Fully On-Line

Build material judgment for the projects that shape South Africa.

A practical foundation course for early-career civil and construction professionals who want to make more informed material decisions—from earthworks to structural systems and roadworks.

Civil infrastructure only performs as well as the materials that carry, bind, protect and finish it. For young professionals, materials knowledge is the bridge between a drawing set and a structure that performs safely through years of traffic, weather, exposure and use.

HAVE A PROFESSIONAL ADVANTAGE

Understand the question before the product is selected, the order is placed or the pour begins.

Key Outcomes of this Course

- **Perform with confidence** – relate material behaviour to strength, stiffness, service conditions and the demand placed on the finished asset.
- **Spend with judgment** - look beyond first cost to material availability, efficient use, maintenance and the long-term value of a choice.



**SCAN TO PURCHASE
BOOKS BUY BOOKS**

- **Specify with assurance** - Build the vocabulary needed to engage with standards, specifications, testing and on-site quality conversations.

Core Reasons for Material Knowledge:

The necessity of material understanding for a civil engineer can be broken down into three critical areas: structural integrity and durability, cost and resource management, and regulatory compliance and quality assurance.

1. **Structural Integrity and Durability** - The primary function of any civil structure is to perform safely and reliably over its intended lifespan. This is directly determined by the properties of the materials employed. Engineers with a deep understanding of materials can select the optimal substance for a given environment, preventing costly, and potentially catastrophic, failures.



2. **Cost and Resource Management** - An engineer's choice of material has a profound impact on the project's budget and long-term economic viability.
 - **Cost Efficiency:** Knowledge of material properties allows engineers to optimize designs, potentially reducing the required volume of high-cost materials (e.g., using high-performance concrete to reduce section sizes).

- **Local vs. Imported Materials:** The South African construction industry is noted for its significant reliance on imported materials, which can account for 40-50% of construction materials [2]. Understanding the properties and availability of locally sourced materials (like aggregates, specialized timber, or locally-produced cement) is crucial for reducing project costs, mitigating supply chain risks, and supporting the local economy.
- **Life-Cycle Costing:** A material with a lower initial cost but high maintenance requirements may prove more expensive over the structure's 50-100 year lifespan. Material knowledge enables engineers to perform effective life-cycle costing, prioritizing long-term value.

A focused route through the materials that shape construction:

The course is structured around material systems encountered across civil engineering and construction work. It gives young professionals a structured starting point from which to ask sharper questions on projects, at suppliers and in the field.

Introduction - Sets the frame for a practical exploration of construction materials.

Soils - Explore the earth materials that form the foundation of many civil works.

Cement - Build context around an essential binder in construction.

Concrete - Develop context around a central engineered material in construction.

Bitumen - Engage with a key material family for road and surfacing applications.

Masonry and Mortar – Examine the materials that assemble durable built form.

Steel - Consider a primary structural material and its role in the built environment.

Timber – Explore the characteristics of a versatile natural construction material.

Plastics and Geofabrics - Extend the material lens to polymer and geosynthetic applications.

PROGRAMME PERSPECTIVE

The course moves across natural, manufactured and composite materials—helping learners connect individual products to the systems they enable.

Turn familiar materials into better decisions:

Early in a career, material choices can feel like a technical detail that belongs elsewhere. In practice, they influence performance, procurement, constructability, maintenance and confidence in every discussion around a project. A deeper foundation helps make those questions visible earlier—and makes your contribution more valuable.

What you can start to do to build a practical material mindset;

- **Read performance in context** - Connect properties to loads, exposure, environmental conditions and intended service life.
- **Compare more than price** - Recognise the relationship between first cost, local availability, maintenance and life-cycle value.



THE DECISION BEHIND THE DETAIL

Safer assets. Stronger value. Longer service life.

Materials knowledge supports choices that are appropriate for the design, the environment and the people who will rely on the finished infrastructure.

For the civil engineer in South Africa, material knowledge is the bridge between theoretical design and physical reality. It empowers them to make informed decisions that account for the unique challenges of the local environment, the economic realities of a market reliant on imports, and the stringent demands of national standards. By mastering the fundamentals of construction materials, South African civil engineers ensure the safety, sustainability, and enduring success of the nation's vital infrastructure.

Invest in Your Future

This on-demand course offers flexible learning, allowing you to enhance your personal development and professional career at your own pace. This on-demand course provides the fundamental materials knowledge needed to be an effective professional on site.

Enrol Today and Supercharge Your Career!

- No need to take any time off work
- No travel and or accommodation costs
- No lost productivity costs

Register @ <https://cpdonline.saice.org.za/>