



GST-04 Ontology and Epistemology

Formal Description

Ontology is the branch of philosophy concerned with what exists in reality.

Epistemology is the branch of philosophy concerned with knowledge, its nature, sources, and justification.

In the EFGST framework, epistemic processes are themselves physical processes occurring within the ontological domain.

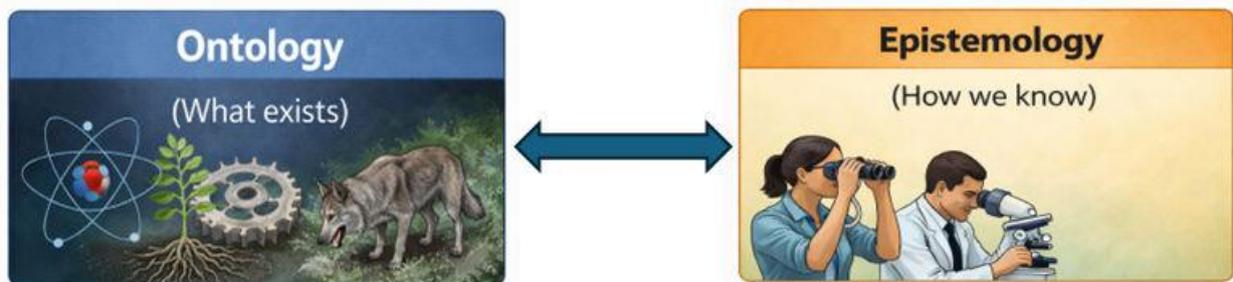
Plain English Explanation

Ontology asks: What exists?

Epistemology asks: How do we know about what exists?

In systems theory, these two questions are closely connected because knowledge itself is produced by physical systems, i.e., our brains.

In this framework, knowledge is not separate from reality. It is part of it. Thoughts and models are themselves physical processes occurring within the world they describe.



Example 1 – A Tree

Ontology: the tree exists as a physical organism.

Epistemology: a scientist studies the tree and forms knowledge about its structure and growth.

Example 2 – Climate Science

Ontology: the climate system exists physically.

Epistemology: climate scientists develop models to understand how it behaves.

Provenance and Links

The terms *ontology* and *epistemology* originate in early modern philosophy:

- Aristotle – foundational work on the nature of being (*ontology*)
- John Locke – early work on the nature and limits of knowledge (*epistemology*)
- Immanuel Kant – systematic distinction between what exists and how we can know it

In contemporary philosophy and science:

- Roy Bhaskar – distinction between the real, actual, and empirical domains
- Mario Bunge – development of a scientific, systems-based ontology



In EFGST, ontology and epistemology are integrated by recognising that knowledge is produced by physical processes operating within the systems being studied.

Practical Exercise

Choose a system (e.g., a city, ecosystem, or organisation).

1. Describe the system ontologically (what exists).
2. Describe how scientists or analysts study the system epistemologically.