Unit 5: Interpretations of Scientific Knowledge

“Physics is like sex: sure, it may give some practical results, but that’s not why we do it.” [1]

Science seems to be our best guide to determining the way the world is. But does the real world actually contain atoms or genes, for example, or is a literal interpretation of our scientific theories unwarranted? Instrumentalism about science is the view that science aims only to develop effective instruments for prediction and control of nature. Scientific realism, in contrast, is the view that science aims to discover the truth about the world and that we have good reason to believe that our current theories are at least approximately true. If realism is correct, a literal interpretation of our best available theories is warranted. However, the underdetermination of theory by evidence, and science’s historical track record of failure, suggest that realism is overly optimistic. Alternative interpretations of scientific knowledge diverge on the extent to which we ought to believe that the world is the way our scientific theories represent it as being.


Unit 5 Time Advisory
This unit should take approximately 16 hours to complete.

☐ Subunit 5.1: 3 hours

☐ Subunit 5.2: 2 hours

☐ Subunit 5.3: 3 hours

☐ Subunit 5.4: 5 hours

☐ Subunit 5.5: 3 hours

☐ Reading: 1 hour

☐ Assessment 7: 2 hours
Unit 5 Learning Outcomes
Upon completion of this unit, the student will be able to:

- Define scientific realism.
- Summarize the key arguments in favor of scientific realism – namely, the “miracle” argument and the argument from independent corroboration.
- Summarize the main objections to scientific realism – namely, the underdetermination problem and the “pessimistic induction.”
- Compare realist concessions to these objections: entity realism and structural realism.
- Compare key variants of scientific antirealism: instrumentalism, constructive empiricism, and social constructivism.
- Assess the preceding philosophical interpretations of scientific knowledge.