

# Academic Integration in Engineering and Technology

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# What is Academic Integration

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- # Exploring the interface between our faith and our discipline.
- # Understanding the philosophical presuppositions of our discipline.
- # Practicing our discipline from a Christian perspective.
- # Enhancing our faith by leveraging our training.



# Key Questions

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- # What is my discipline?
- # What is the nature of my discipline?
- # What do I take for granted?
- # Are my presuppositions compatible with my faith?
- # Does it make a difference to my discipline that I am a Christian?
- # Does it make a difference to my Christianity that I am in my discipline?

# What is My Discipline?

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# Engineering and/or Technology

# Issues

- Too broad?
- What exactly is engineering (or technology)?



# Academic Presuppositions

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- # What presuppositions do we make in engineering and technology?
- # Not well studied!
- # Philosophy of technology/engineering? [Funk, Audenaert, Bork]
- # Philosophy of science? [Grabow]
- # Interface of engineering with science? [Prud'homme, LeDuc]

# Natural Interfaces with Faith

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- # Ethics in engineering and technology.  
[Bell, Collins, Niewoehner, Jordan, Pulliam, Reeves-Shepherd]
- # Engineering professionalism.  
[Carson, Rine, Higgs]
- # Engineering and human well-being.  
[Clark, Reilly]
- # Harmony of Christianity and nature.  
[Tedder, Mowry, Prabhu, Wyatt, Garrett, Gerdeen]



# Example Analysis

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- # Confine to my subdiscipline:  
Information sciences.
- # Academic orientation: analytical,  
theoretical, mathematical.

# Outline of Analysis

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- # Metaphysics: **realism**.
- # Philosophy of science: **nonrealism**.
- # Analysis of presuppositions.
- # Impact on apologetics.
- # View of creation-evolution debate.
- # View of Biblical inerrancy.



# Scientific Nonrealism

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- # Basic premise: Successful scientific theories are rational and useful, but their details may not correspond to “real” entities.
- # A form of scientific skepticism.
- # Example positions: phenomenalism, internal realism [Putnam], constructive empiricism [van Fraassen], instrumentalism [Fine].
- # What are its roots?

# Positivism

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- # “I take the positivist viewpoint that a physical theory is just a mathematical model and that it is meaningless to ask whether it corresponds to reality. All that one can ask is that its predictions should be in agreement with observation.”

[Stephen Hawking, *The Nature of Space and Time*, 1996, pp. 3–4]



# Reality and Metaphysics

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- # Metaphysics: The fundamental nature of all reality, whether visible or invisible.
- # My metaphysics: realism, in the sense that there are “real” entities that exist apart and independent from me.
- # Can Christians hold any other kind of metaphysics?

# Metaphysics and Science

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- # Metaphysical realism is *not* the same as scientific realism.
- # Metaphysical realism + scientific nonrealism  $\Rightarrow$  the details of science are not necessarily “true.”
- # Doesn't mean there is no truth, or that truth cannot be “known.”



# Examples

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## # Gravity

- Classical view: a force acting at a distance
- General relativity: warping of space-time
- String theory: a particle (graviton)

## # Light

- Classical view: a wave
- Modern view: a particle (photon)
- Wave-particle duality?

# Link Between Science and Reality?

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- # Hawking: there is no link! (Naturalism?)
- # Worrall's *structural realism*, Fine's *natural ontological attitude*, and Cartwright's *patchwork realism*.
- # Christian response: God created our senses in such a way that what we sense is “linked” to reality.
- # Ad hoc? Cf. Einstein



# Epistemological Implications

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- # Exactly what can science tell us?
- # Scientific skepticism: Question what science can tell us about metaphysics.
- # Example:
  - Why does an apple fall to the ground?
  - Will this apple fall to the ground?
- # Scientific skepticism limits the scope of scientific enterprise.

# Creation-Evolution Debate

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- # Traditional focus of debate:  
Is the theory of evolution true?
- # Basis (very roughly):
  - Theory of evolution tells us that life came about through “randomness.”
  - Randomness  $\Rightarrow$  no God.
  - Therefore, evolution  $\Rightarrow$  no God.



# View of Evolution

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- # Scientific skepticism: Question what evolution tells us about God.
- # Even if “its predictions should be in agreement with observation,” so what?
- # So the traditional focus seems misguided.
- # Still have to consider apologetic (rhetorical) dimension of debate.

# View of “Creation Science”

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- # Among the many scientific approaches to creation, some of the most credible are theories based on “irreducible complexity” and “specificity” [Behe, Dembski]
- # If they succeed, then evolution fails.
- # Scientific skepticism: Still doesn't imply that God created.
- # Dilemma: apologetics greatly eased by successful “scientific” approach to creation.
- # What about exposing flaw in view of science?



# Compatibility with Other Christian Views

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- # How does my view of science reconcile with other Christian views?
  - William Paley's *Natural Theology*
  - Alister McGrath's *Scientific Theology*
- # Not incompatible. The main difference lies in what we consider “scientific.”

# View of Biblical Inerrancy

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- ✚ “We deny that Biblical infallibility and inerrancy are limited to spiritual, religious, or redemptive themes, exclusive of assertions in the fields of history and science. We further deny that scientific hypotheses about earth history may properly be used to overturn the teaching of Scripture on creation and the flood.”  
[Chicago Statement on Biblical Inerrancy, Article XII]



# Detailed Inerrancy

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- # A narrow view of Biblical inerrancy:  
That the “Bible's truth [is tied to] to its historical and *scientific factuality*.”  
[Perry 2001]
- # Scientific factuality: Not an appealing view for scientific nonrealists.
- # Therefore, detailed inerrancy is not an appealing position on inerrancy.
- # There are alternative positions on inerrancy!

# Consider Key Questions

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