Introduction
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- Objectives and methodology
- The information-driven scientific method
- Ontologies and semantics for biomedical information
- Term paper instructions
Objectives and methodology

- Set the intellectual context
- Define the scientific and engineering challenge
- Design a solution
- Implement the solution
- Examine the consequences
Objectives and methodology

The Syllabus

PART I: BASIC TECHNOLOGIES (3 Weeks)

PART II: SELECTED EXAMPLES (4 Weeks)

PART III: DATA INTEGRATION AND ANALYSIS (1 Week)

PART IV: STUDENT PRESENTATIONS (2 Weeks)
The information-driven scientific method
The information-driven scientific method

Image removed for copyright reasons. Computer rendering of knee joint.

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Ontologies and semantics

Ontology:
A specification of a conceptualization
Tim Gruber, Stanford, circa 1993

Semantics:
The science of meanings . . .
for communication and interchange
of scientific information
Keys to biological computing standards

- **Semantics**
  - Investigators can agree on meaning
  - Ontologies for standardizing meaning
  - Curation of ontologies – the *LSID*

- **Schema**
  - Share schema and concepts

- **Scaleability**
  - The ability to scale to larger problems in the future

- **Standard tools**
  - Ontologies and schema for storage and query
  - Possibility to write reusable software!!!
An example of a biological database schema
Term paper instructions