1. Introduction: The Ways of Nature

Prerequisites:

1. Basic concepts of special relativity.
2. Elementary quantum mechanics.

Subjects explored:

1. Theories of relativity (geometrical structure of space and time; gravity).
2. Quantum mechanics and quantum field theory (microscopic world).
3. Statistical mechanics (micro $\leftrightarrow$ macro world).
4. Cosmology.

Some observations about "good" theories:

1. A good theory is not "refuted", but "extended", when faced with experimental evidence it cannot account. Thus, there is a core of "truth" in it that is preserved in the superceding theories.
2. A good theory should have a coherent, logical, and esthetically pleasing internal structure that is build on a minimal number of assumptions.

Unifying themes:

1. Geometry: differential geometry and gauge theory.
2. Functional integrals: quantum field theory and statistical mechanics.