Criteria for General Education Credit in
Foundations of Scientific Inquiry

As stated in the guidelines regarding courses in the Foundations of Scientific Inquiry (FSI), the aim of these course offerings is:

To ensure that students gain a fundamental understanding of how scientists formulate and answer questions about the operation of both the physical and biological world. These courses also deal with some of the most important issues, developments, and methodologies in contemporary science, addressing such topics as the origin of the universe, environmental degradation, and the decoding of the human genome. Through lectures, laboratory experiences, writing, and intensive discussions students consider the important roles played by the laws of physics and chemistry in society, biology, earth and environmental sciences, and astrophysics and cosmology.

In terms of what the sub-committee is looking for in these courses, this translates into, "**students must learn how scientists do science"**. This means:

- Students should be exposed to current methodologies, techniques, and literature in some area of science to get the full experience of doing research in the particular field.

- Discussion of science should be done from a scientific perspective, with an emphasis on the way scientists think in terms of hypothesis formation and testing. Students must learn how scientific experiments or studies are constructed with proper controls, how all measurements have associated uncertainty, and how these uncertainties limit the conclusions that can be drawn from scientific work.

- The focus should not be on science in a historical or cultural context, although these may be part of the course. Instructors of survey courses that give an overview of the field should be particularly conscious of this, and be sure to include material on how science actually gets done, and not just the results of those findings. For example, in every area of science there are classic experiments or studies that can be discussed in detail in the classroom to illustrate the scientific method while also teaching important scientific concepts relevant to the specific field.

- Students should come away from the FSI GE experience scientifically literate and able to evaluate information critically in a scientific context. Students should learn how to conceive testable hypotheses, design logical experiments or studies to address them, and draw justifiable conclusions from the data with associated uncertainties.

- If there is a laboratory component to the course it can include various ways of allowing students hands-on experience in the field. These include:
  - Formal 'wet' labs with students doing data collection
  - Demonstrations with students as active participants in observing the outcome
  - Computer simulations of processes or techniques
  - Field trips that show particular techniques or unique locales
  - Independent data collection outside of class.

Any lab should be done under sufficient instructor or Teaching Assistant supervision. This should include regular meetings (usually weekly or biweekly) to perform the labs or go over results found outside of class time. Laboratories should include some quantitative analysis of data and how this is used in hypothesis testing.

- At least half of the course should cover the particular science area (Life or Physical Sciences) using the standards outlined above to get FSI credit.

- Although the division between Life and Physical sciences is usually clear (and follows the line of division within the college), for some areas, such as geography or statistics, credit is determined more by the focus of the particular class. Math courses are generally given Physical Science credit, unless they focus on methodologies used in the Life Sciences.

- As these are GE courses, they should be introductory and have no prerequisites. Any student should be able to take them and understand the material with the background expected from all incoming UCLA students.