

Statement of Expectations for Natural Sciences Core Curriculum Courses

(1) This Statement of Expectations applies to all courses that satisfy the Natural Sciences (NS) component of the Core Curriculum of the College of Arts and Sciences (A&S). These university-level science courses are less about memorization of facts, more about understanding of concepts and processes. The goals of the natural science component of the A&S core curriculum are quoted here from page 70 of the 2004-5 catalog:

9. Natural Science (13 semester hours, including a two-course sequence and a laboratory or field experience). These courses study the nature of matter, life, and the universe. They enhance literacy and knowledge of one or more scientific disciplines, and enhance those reasoning and observing skills that are necessary to evaluate issues with scientific content. Courses are designed to demonstrate that science is not a static list of facts, but a dynamic process that leads to knowledge. This process is one of subtle interplay between observation, experimentation, and theory, enabling students to develop a critical view toward the conclusions and interpretations obtained through the scientific process.

Through a combination of lecture courses and laboratory or field experiences, students gain hands-on experience with scientific research. They develop observational skills of measurement and data interpretation and learn the relevance of these skills to the formation and testing of scientific hypotheses.

The goal of this requirement is to enable students to understand the current state of knowledge in at least one scientific discipline, with specific reference to important past discoveries and the directions of current development; to gain experience in scientific observation and measurement, in organizing and quantifying results, in drawing conclusions from data, and in understanding the uncertainties and limitations of the results; and to acquire sufficient general scientific vocabulary and methodology to find additional information about scientific issues, to evaluate it critically, and to make informed decisions.

The natural science requirement, which consists of passing 13 hours of approved natural science course work, includes one two-semester sequence of courses and at least 1 credit hour of an associated lab or field experience. No more than two lower-division courses may be taken from any single department (1-credit-hour lab/field experience courses are excepted).

Students who graduate with a major in the natural sciences (astrophysics, biochemistry, chemistry, EBIO, geology, kinesiology (now IPHY), MCD biology, or physics) or students who graduate with a minor in EBIO are exempt from completing the natural science requirement.

(2) In all NS core curriculum courses, students should expect between two and four hours of outside independent study, for every hour of in-class lecture. This will usually entail homework assignments, reading, and exam preparation.

(3) A 1-unit lab usually involves attending 2 hours per week of in-lab work plus approximately 2 hours of preparation, report-writing, etc. When a lab is attached to a lecture course a passing grade in the lab is usually required to pass the whole course.

(4) Grades earned in Natural Sciences Core Curriculum courses have the meaning defined by the Office of the Registrar: A–Superior/Excellent; B–Good/Better Than Average; C–Competent/Average; D–Minimum Passing. Faculty are encouraged to use their best professional judgment to assign grades consistent with these definitions.

(5) Science involves quantitative analysis. Basic levels of quantitative reasoning and mathematical skills are necessary for all NS core courses. Before students enroll in a NS core course they are strongly encouraged to first satisfy any MAPS deficiencies in math or science (see catalog p7) as well as satisfy the QRMS component of the NS core curriculum, as described on page 65 of the 2004-5 catalog:

2. Quantitative Reasoning and Mathematical Skills (QRMS) (3-6 semester hours). Liberally educated people should be able to think at a certain level of abstraction and to manipulate symbols. This requirement has two principal objectives. The first is to provide students with the analytical tools used in core curriculum courses and in their major areas of study. The second is to help students acquire the reasoning skills necessary to assess adequately the data that will confront them in their daily lives. Students completing this requirement should be able to: construct a logical argument based on the rules of inference; analyze, present, and interpret numerical data; estimate orders of magnitude as well as obtain exact results when appropriate; and apply mathematical methods to solve problems in their university work and in their daily lives.

An online self-test is provide for students to evaluate their preparedness for taking NS core courses at <http://aac.colorado.edu/orientation/mathtest.asp>. Examples of the mathematical reasoning often employed in NS core courses as well as a math reminder resource site will be implemented on the A&S website during Fall 2005.