

APPENDICES

APPENDIX A. Report of the SMT General Education Review Subcommittee

At the behest of the Ad Hoc General Education committee that each division meet and review its entire curriculum in the light of specific guidelines, a representative committee was established by the Science/Math/Technologies/Division. The following represents, formulated with much care and deliberation, the subcommittee's evaluation, general philosophy and recommendations regarding that specific element of general education termed "Natural Science."

Within the broad scope of the vague Ad Hoc Committee guidelines, there is the necessity of grappling with a more precise operational definition of "Science," as well as the further question of what constitutes a "Science Experience" in a student's overall education. At fundamental issue is the uniqueness of such an experience. Upon introspection and examination, one finds that the common feature of all scientific endeavor is the organization and expansion of knowledge by systematic investigative means, and that this feature is characteristic of true science regardless of subject area of nature.

Upon considering science more as an intellectual process rather than merely a comprehensive subject area of data, it is the committee's collective judgment that artificial distinctions of specific discipline areas, such as physical science, life science or earth science, is neither necessary nor desirable. Indeed, to draw such strict distinctions would be to negate the possibility of valid cross-disciplinary courses which could not conveniently fall within the realm of a single category.

In order to come to some operational conclusion about the meaning of science as a part of General Education, more defined criteria and objectives are required. A "Science Experience," especially in terms of a one-time educational opportunity for a non-science major, requires that a student at least be able to understand if not indeed use the underlying investigative methods of science. To best accomplish the overall desired objectives of such a "Science Experience," the following criteria were developed to define what is the best and most valid science experience offerable in the overall concept of general education.

1. The subject material should be of sufficiently broad nature as to provide the student with a scope of information which will help develop within the student the ability to objectively deal with the events and responsibilities of daily life
2. "SCIENCE" should be taught as an intellectual process of problem solving — and the development of the common elements of logic used to solve problems scientifically. The student should be required to participate in scientific endeavor rather than function merely as the passive recipient of information gained by past scientific discoveries.
3. The student should be provided with a realistic picture of science as a process whereby man explores his environment and should be acquainted with the role of science as a powerful social and intellectual force in society.

Utilizing the broad criteria of the Ad Hoc Committee as well as the aforementioned refined criteria of "Science" in particular, an evaluation of each class offering within the SMT Division has been undertaken. Such analysis has been painstakingly undertaken, utilizing course outlines, stated course objectives, course descriptions, textbooks, and any other information available to the subcommittee. Based upon this careful and lengthy evaluation, the following courses are considered to meet G.E. requirements:

Astronomy 10	Meteorology 1
Biology 3, 4, 7, 11, 20, 21, 22, 23, 25	Oceanography 10
Chemistry 1a, 1b, 12a, 12b	Physical Science 10
Geology 1a, 1b, 10	Physics 2a, 2b, 4a, 4b, 4c, 10

Since the course list is based upon the role and function of science as an area of student enrichment, there is no rationale for distinguishing specific course differences for CSU transfer certification and Skyline AA certification. As the lists would be based upon the same criteria, the analysis is the same in both cases.

Upon careful consideration, it is the recommendation of the SMT General Education Subcommittee that G.E. transfer certification require the completion of two courses from the Natural Science list, preferably within different catalog headings.

Scientific problem solving requires cultivation like any other intellectual skill, but also involves the common use of concrete test elements — tools. Indeed, the actual experimental processes of scientific investigation usually involve physical manipulation within something of a "Laboratory Environment." Such an environment need not always fit the classical concept of an equipment filled room, but may indeed be any physical facility where measured quantitative and qualitative investigation is functionally possible. The opportunity to actually perform meaningful experiments, to come into contact with the actual materials of which lecture concepts are formed, and to physically as well as intellectually participate in scientific discovery is an important part of a college student's overall education. In response to this importance, it is the opinion of the subcommittee that, of the two Natural Science courses undertaken to fulfill CSU General Education Certification, one be a laboratory science.

Taken together, the design of Natural Science courses applicable to G.E. should place a considerable emphasis on science as an approach to knowledge as well as a body of organized knowledge. Such an increased emphasis on the epistemology of science is not an attempt to supplant scientifically derived information with an abstruse examination of things "scientific," but rather to permit the student to participate in the dynamic aspect of science — the process of discovery. If a student has a realistic and critical picture of science and he is armed with an understanding of the attitudes and approaches which characterize science, he will be better able to function as a thoughtful and intelligent member of society. While the sub-committee's evaluation of existing course offerings necessitated a binary "yes" or "no" conclusion, any and all courses should do with introspection and reevaluation of objectives, especially in terms of general education.

In an effort to complete its assignment in a reasonable amount of time, the committee was conscientious in sticking to the immediate issues. Although we did have some discussions about curriculum design, teaching strategies, and the implementation of our recommendations, we believe these are considerations which require everyone's participation. Some broader concerns which we believe require your attention are:

1. Regularly scheduled offerings dealing with the processes of scientific discovery utilizing the physical sciences are limited.
2. There are certain "areas" of scientific thought which are not currently represented that perhaps should be represented.
3. Laboratories designed with general education objectives in mind seem to be scarce, especially at the "less sophisticated entry levels" of many of our students.
4. Current offerings tend to emphasize the traditional fragmented approach to knowledge and problem solving. Considering the underlying common elements of scientific investigation and problem solving, there is no reason to believe that introductory cross-disciplinary offerings could not be offered by interested instructors whenever participation and facilities are available.

SMT Division
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