

SOUTHEAST MISSOURI STATE UNIVERSITY

Department of Biology

GI 603

AP Institute: Biology

New: Fall 1996

I. Catalog Description and Credit Hours of Course:

A course designed to assist high school biology teachers in offering Advanced Placement Biology as part of their curriculum. 8 days, from 8a.m. - 5p.m. each day, lab and lecture. Summer. 3 credit hours.

II. Prerequisites:

Certified biology teacher.

III. Objectives of the Course:

- A. To prepare students to be able to teach AP Biology in their high schools.
- B. To review and reinforce basic concepts and principles in the field of Biology, including biological chemistry, cells, energy flow, molecular genetics, heredity, evolution, ecology, taxonomy, and biological diversity, especially in the plant and animal kingdoms.

IV. Expectations of Students:

To attend class, take pre- and post-tests, and participate in all laboratory exercises/field trips.

V. Course Outline:

The institute will attempt to cover as many of the topics in the "Advanced Placement Biology Course" as possible during the 8-day session, with particular emphasis on conducting the lab exercises. A listing of the major topics for potential discussion is provided below:

- A. Molecules and Cells
  1. Biological Chemistry
  2. Cells
  3. Energy Transformations
- B. Genetics and Evolution
  1. Molecular Genetics
  2. Heredity
  3. Evolution
- C. Organisms and Populations
  1. Principles of taxonomy and systematics, 5-kingdom system
  2. Survey of Monera, Protista, and Fungi
  3. Plants
  4. Animals
  5. Ecology

Specific lab exercises to be conducted, field trips, and their approximate time allotment are listed below:

- |                                                   |           |
|---------------------------------------------------|-----------|
| 1. Diffusion & Osmosis                            | (1/2 day) |
| 2. Enzyme Catalysis                               | (1/2 day) |
| 3. Mitosis & Meiosis                              | (1/4 day) |
| 4. Plant Pigments & Photosynthesis                | (1/2 day) |
| 5. Cell Respiration                               | (1/2 day) |
| 6. Molecular Biology                              | (1/2 day) |
| 7. Genetics of <u>Drosophila</u>                  | (1/4 day) |
| 8. Population Genetics and Evolution              | (1/4 day) |
| 9. Transpiration                                  | (1/2 day) |
| 10. Physiology of the Circulatory System          | (1/4 day) |
| 11. Behavior: Habitat Selection                   | (1/2 day) |
| 12. Dissolved Oxygen/Aquatic Primary Productivity | (1/4 day) |
| 13. Field Trip to Pine Hills Ecological Area      | (1/2 day) |
| 14. Field Trip to Little Grand Canyon             | (3/4 day) |

Remainder of the 8-day institute will include review/discussion of topics listed above, development of course syllabi, and discussion of alternate strategies/methodology for covering topics, especially for lab exercises.

#### VI. Textbook:

Campbell, N. A. 1996. Biology, 4<sup>th</sup> edition. The Benjamin/Cummings Publishing Company, Inc.; Menlo Park, CA.

#### VII. Basis for Student Evaluation:

The course will be graded on a pass-fail basis. Credit will be awarded for successful participation in all activities, including pre- and post-tests, and a set of genetics problems.