IDH 109
Contemporary Problems in Science and Technology

I. IDH 109 Contemporary Problems in Science and Technology - 4 Semester Hours

II. Course Description

This course is an integrated study of the testing and implementation of modern theoretical principles in science, technology and mathematics. The role of science in identifying problems and proposing solutions to critical issues in society is stressed. Chemical, biological, physical, economic and political aspects of the environmental issue are the central focus for the course. Laboratory is required.

III. Prerequisite

Admission to the Honors Program or consent; MTH 112 and IDH 106 or ENG 101. A chemistry course is recommended.

IV. Textbook

Due to the varied selection of quality college level textbooks, each college will select the textbook needed to meet the requirements of this course.

V. Course Objectives

After successfully completing this course the student will be able to:

A. Understand the processes and limitations of the scientific method.
B. Formulate and understand alternative solutions to the problems created by modern technology.
C. Demonstrate that he is scientifically literate.
D. Use acquired laboratory skills to demonstrate the data collection that is necessary to make scientific decisions.
E. Use issues relating to the environment as a model for applying biological, physical, chemical, technological, sociological and economic factors in addressing contemporary problems.
Objectives:

A. Understand the processes and limitations of the scientific method. The student will be able to:
1. Distinguish between valid scientific investigation and non-science.
2. Describe the progression from hypothesis to theory to law in the scientific method.
3. Recognize bias in a scientific investigation or in a report of a scientific investigation.
4. Discuss depth versus breadth of scientific inquiry.
5. Discuss ethical decision making in terms of “who controls science” and “right” decisions.

B. Formulate and understand alternative solutions to the problems created by modern technology. The student will be able to:
1. Discuss disposal alternatives for solid, liquid, and radioactive wastes.
2. Discuss the impact of solid, liquid, and radioactive waste on the environment.
3. Describe how population growth affects and is affected by modern technology.
4. State the basic laws that govern population growth.
5. Describe the advantages, disadvantages, and availability of alternative energy sources for developed, developing, and underdeveloped nations.
6. Describe the problems associated with urbanization.
7. Describe the environmental impact of pesticides, the basic chemical structures of pesticides, and efforts to control pests by alternatives to pesticide usage.
8. Contrast the qualitative a quantitative differences in energy consumption among people in a developed, developing, and underdeveloped nation.
9. Distinguish between primary, secondary and tertiary treatment in water purification.

C. Demonstrate that he is scientifically literate. The student will be able to:
1. Use scientific terminology appropriately in oral presentation of daily readings.
2. Differentiate between developed, developing, and underdeveloped nations.
3. Describe environmental disruptions that have the potential for long-range degradation of the environment.
4. Summarize the cyclic activities comprising nutrient flow and exchange in the earth’s environment.
5. Describe contemporary terms such as: greenhouse effect, nuclear winter, ozone layer, and acid rain.
6. Write a critical analysis of three novels which have environmental and/or technological themes.
7. Explain the effect of polarity of molecules on solubility and behavior.
8. Explain the role of DNA in controlling cell functions and describe the application of this to genetic engineering.
9. Describe the major geographical and political subdivisions of the earth.
10. Demonstrate use of the periodic table to predict chemical formulas.
11. Participate in both formal and informal activities centering on contemporary issues in science and technology.

D. Use acquired laboratory skills to demonstrate the date collection that is necessary to make scientific decisions. The student will be able to:
   1. Apply simple statistical methods to laboratory data in order to determine the validity and precision of the data.
   2. Demonstrate the ability to use common laboratory equipment.
   3. Demonstrate techniques of: sampling, data collection, report of findings and interpretation of findings.
   4. Enter laboratory data into a computer database and generate reports/graphs of these data.
   5. Interpret data presented in graphic form.
   6. Write a clear and concise report of laboratory operations and findings.

VI. Course Outline of Topics

VII. Evaluation and Assessment

   Evaluation of class participation
   Written exams
   Lab reports
   Oral exams / presentations

   Grades will be given based upon A = 90 – 100%, B = 80 – 89%, C = 70 – 79%, D = 60 – 69%, and F = below 60%.

VIII. Attendance

   Students are expected to attend all classes for which they are registered. Students who are unable to attend class regularly, regardless of the reason or circumstance, should withdraw from that class before poor attendance interferes with the student’s ability to achieve the objectives required in the course. Withdrawal from class can affect eligibility for federal financial aid.

IX. Statement on Discrimination/Harassment

   The College and the Alabama State Board of Education are committed to providing both employment and educational environments free of harassment or discrimination related to an individual’s race, color, gender, religion, national origin, age, or disability. Such harassment is a violation of State Board of Education policy. Any practice or behavior that constitutes harassment or discrimination will not be tolerated.
X. **Americans with Disabilities**

The Rehabilitation Act of 1973 (Section 504) and the Americans with Disabilities Act of 1990 state that qualified students with disabilities who meet the essential functions and academic requirements are entitled to reasonable accommodations. It is the student’s responsibility to provide appropriate disability documentation to the College.