GEL/INT 3300 G-Science and Technology-A Promise or a Threat? (3-0-3) F, S, SU. The course will discuss the methods and development of scientific discoveries, their technological applications, and the impact of these activities on cultural, social, political and religious values. The influence of society on scientific research and technological development will be also discussed. **Prerequisite- junior standing. Writing active.**

2. **Student Learning Objectives**

a. One of the course’s objectives is to enhance students’ ability to write, focusing on a particular topic, in an organized manner and to the point. The topics are selected to develop students’ reasoning ability, critical thinking, writing and speaking capabilities. In order to provide students with the opportunity to speak in a large group setting, the instructor grades these papers and required students to debate and to discuss their contents during class sessions. One clear objective of modern science and contemporary scientists is to combat assorted claims to inherent superiority associated with “isms,” such as racism, sexism, ageism, ethnocentrism, and anthropocentrism. Science by its nature combats irrationality and explains and promotes diversity. To accomplish this end, students will write about, and participate in class discussions relevant to the following topics.

- To demonstrate an understanding of a current scientific research and its possible technological applications, the student will write 2-3 essays and give relevant examples illustrating the ethical, social and legal implications for different members of society (writing, critical thinking)

- To demonstrate his understanding of differences between two civilizations, the student will write a 2-3 page paper comparing the cultural, religious and scientific views of each civilization (writing, critical thinking)

- To develop logical approaches regarding the role of citizens living in a nuclear society, the student will discuss in class points of concern regarding nuclear waste disposal site locations and be able to list alternatives solutions to problems. (critical thinking)

- To develop a practical approach to the scientific research/technological applications and perceived ethical and social implications, the student will write a one-page paper describing his/hers position (pro or con) on a selected scientific research/technological applications (writing, critical thinking).
• To clarify the areas of conflict between science and technology and religion, the student will write essay explaining his own conflict (writing, critical thinking).

• Students will demonstrate by means of short essays the advantage and disadvantage of a particular scientific discovery and its technological applications (writing, critical thinking)

b.

• Students will demonstrate through class discussions how scientific literacy (or illiteracy) will impact the societies use and misuse of scientific discoveries and technological development.

3. Course Outline

I. Introduction - Overview - A journey through space and time
   A. Comparison of the Earth with other planets in the solar system
   B. Emergence, adaptation, evolution, and extinction of living things - nature's way
   C. The nature of growth: Exponential trend
   D. Historical perspective: How various civilizations and cultures have related to the nature of science and technology and the profound impact of the Scientific and Industrial Revolutions

II. Characteristics of science and technology and their relationships and interactions
   A. Definitions
   B. Methods
   C. Science and Technology - A double-edged sword

"As the circle of light grows, so the circumference of darkness around it"
Albert Einstein

D. The importance of science and technology in contemporary society
   1. Social and cultural roles of science and technology
   2. The influence of modern society on science and technology
   3. Science and Religion: Are the differences reconcilable?

E. Managing science and technology: Are we vigilant or complaisant?
The power and influence of science and technology have changed everything. Have we changed our way of thinking to manage this power?

   1. Are social, educational, political, religious and economic institutions guiding scientific research and discoveries and technological developments and applications, or are they driven by it?

FIRST PAPER
F. Future trends in science and technology: Scientific discoveries and their technological applications have been growing exponentially. Are societies adjustments to these trends comparable?
   1. What should our vision be for the future?
   2. Are we planning for the future on the tidal waves of change?
   3. Will we do the right thing?

III. Nuclear Materials

"The unleashed power of the atom has changed everything except our way of thinking, and thus we drift toward unparalleled catastrophe" - Albert Einstein, 1946

A. Nuclear power plants and their consequences
B. Nuclear waste and its disposal dilemma
C. Nuclear bombs and their threats

FIRST TEST

IV. Social and Ethical Issues in Science and Technology

A. Definition: The nature of ethics
   a. Class discussions: Application of definition to a current technology?
B. Relationship between Science and Technology and Ethics
   b. Class discussions: did we handle nuclear research and applications ethically?
C. Science and Technology and Resistance to change
   c. Case; computer applications

SECOND PAPER

D. Exercises: Students will choose scientific projects (other than those that were discussed in the class) and their technological applications and discuss the benefits and adverse effects for each. Students will also discuss ways in which the scientific researches and their technological development could be approached to create a more positive outcome for society as a whole.

FINAL TEST

4. Evaluation of Student Learning
a. The two comprehensive papers and several authentic short essays will determine students’ writing and critical thinking abilities. Class presentations and discussions will indicate students’ speaking skills as well as reasoning and critical thinking abilities. The aim of the course Science and Technology–A Promise or a Threat? is to involve students in an extensive amount of debate concerning applications of scientific and technological discoveries and their ethical and legal implications. As such, this requires an effective participation of citizens in developing consensus as to how these discoveries are implemented. Discussing such issues will greatly enhance students’ citizenship outlook. The course also provides a listserve, where students freely debate and discuss the course’s relevant issues. The two comprehensive papers, short essays, class presentations and discussions, two tests, several short quizzes and class discussions will determine the extent that the students have accomplished the course’s learning objectives. The final course grade will be determined by the sum of four grades for a total of 100 percent as follows:

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<tr>
<th>Grade</th>
<th>Percentage</th>
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<tr>
<td>Midterm test</td>
<td>(25%)</td>
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<tr>
<td>Final test</td>
<td>(25%)</td>
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<tr>
<td>Papers</td>
<td>(30%)</td>
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<tr>
<td>Short essays and quizzes</td>
<td>(20%)</td>
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b. Students are required to write at least two comprehensive papers and several short essays discussing topics relevant to the course. The instructor grades the papers, and students are required to debate and discuss the contents during class sessions.

5. Rationale

a. The course will be placed in the Scientific Awareness-physical science non-laboratory segment. In order to articulate methods and development of scientific inquiries and principles and their impact on society, examples of current scientific researches and their technological applications will be discussed and debated.
b. Because of the nature of the topics, level of writing, and extent of classroom discussions, the course will be most beneficial to students with at least a junior standing.
c. This is a revision of GEL/INT 3300C and should maintain the same curriculum i.d. as GEL/INT 3300C.
d. The course may count as an elective in Earth Science minor and geology minor.

6. Implementation
REVISED COURSE PROPOSAL

a. Course initially will be assigned to Alan Baharlou
   2. Handouts and reading assignments discussing relevant current topics
c. No additional cost
d. Spring 2001

7. Community College Transfer

   not applicable

8. Date approved by the Dep.of Geology/Geography 2/18/2000

9. Date approved by the COS Curriculum Committee 3/24/00

10. Date approved by the School of Technology 4/7/2000

11. Date approved by the Lumpkin College of Business & Applied Sciences Curriculum Committee 4/10/2000

12. Date approved by CAA 10/19/2000