

ENGR – 300

Societal Issues

in

Engineering Professional Practice

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This course is intended to satisfy the “**Issues in Professional Practice Course Requirement**” for the Graduate Engineering program at Santa Clara University. The goal of the course is to gain an understanding of the societal impacts and implications of emerging technologies in engineering practice. To accomplish this, the course will address various areas of these emerging technologies and their projected impact on society. Guest lecturers from industry will address some of the sessions to provide the students with insights into their particular corporation’s emerging use of technology. Their emphasis will stress why the awareness of societal impacts is critical to achieving sound technological progress.

Grades for the course will be determined on the basis of:

[Class participation / weekly analysis reports 50%](#)

[A research paper - 5-10 pages 25%](#)

[Technology Link Database 25%](#)

Class participation / weekly analysis reports: Attendance in class is **mandatory** . I reserve the right to deduct 5% from your overall grade for EACH class you miss during the quarter. (This is not a bluff, ask the students who have taken my courses in the past).

Students may be required to prepare a class presentation of a particular area of technology with its societal analysis.

Students will be required to prepare a written report of each of the cases covered during the course. Each report should be 2-3 pages in length and conform to the technology assessment outline provided. Reports should be submitted electronically in RTF format prior to the next class.

The **research paper** assignment presents you with an opportunity to investigate a technology issue with which you are most interested. This paper should be an analytical essay, i.e., an in-depth discussion that also defends a particular position. This research paper must utilize at least two high quality academic sources outside of the required readings. Both form and content are important for the success of this assignment. The research paper shall utilize HTML as the presentation medium. Correct spelling, grammar, and citation of sources are expected. This paper should be 5-10 pages in length. You should be prepared to present your papers at the last class on 03/13.

The **Technology Links Database:** This database consists of website links utilized by students of this course in order to learn the concepts of the various technologies presented. The objective of this assignment is to create additions to this database that provide excellent explanations of various Technologies. The student will be required to enter at least 20 links into the database.

Tentative Class Schedule

<p>Class 1. 01/08</p> <p>Introduction</p> <ul style="list-style-type: none">1.1.Course outline1.2.Detailed Introduction1.3.Survey form1.4.Ethics in Technology<ul style="list-style-type: none">1.4.1.What is morality1.4.2.What is ethics1.4.3.Do technology and Ethics interact?1.4.4.How do we use technology for mankind's benefit?	<p>Class 6. 02/12</p> <p>Guest: Robert Finocchio</p> <p>Databases</p> <ul style="list-style-type: none">6.1. What information is being kept?6.2. Who uses this information?6.3. Information is the source of knowledge, who has access to this informtion?
<p>Class 2. 01/15</p> <p>Guest: Joseph DeRisi</p> <p>Medicine</p> <ul style="list-style-type: none">2.1. Prosthetics2.2. Remote Surgery2.3. Augmentation2.4. Instrumentation2.5. Artificial organs2.6. Micro cellular arrays	<p>Class 7. 02/19</p> <p>Guest: Student Presentation</p> <p>Energy</p> <ul style="list-style-type: none">7.1. Fossil fuel energy production7.2. Nuclear Energy<ul style="list-style-type: none">7.2.1. Fission7.2.2. Fussion7.3. Alternative sources of energy<ul style="list-style-type: none">7.3.1. Solar7.3.2. Geothermal7.3.3. Fuel Cells
<p>Class 3. 01/22</p> <p>Guest: Michael Taylor</p> <p>Microelectronics</p> <ul style="list-style-type: none">3.1. Silicon3.2. Biological3.3. Nanotubes3.4. Optical3.5. Quantum Computation	<p>Class 8. 02/26</p> <p>Guest: Student Presentation</p> <p>Biotech</p> <ul style="list-style-type: none">8.1. Sequencing machines8.2. Genetically engineered food

<p style="text-align: center;">Class 4. 01/29 Guest: Student Presentation</p> <p><i>Transportation</i></p> <ul style="list-style-type: none"> 4.2. Earthquake resistance 4.3. Vehicles should be made environmentally safe 4.4. Alternative fuel sources <ul style="list-style-type: none"> 4.4.1. Fuel Cells 4.4.2. Electric 4.4.3. Hydrogen 	<p style="text-align: center;">Class 9. 03/05 Guest: Student Presentation</p> <p><i>Communications</i></p> <ul style="list-style-type: none"> 9.1. Traditional Telco 9.2. Internet 9.3. Wireless
<p style="text-align: center;">Class 5. 02/05 Guest: Christopher Kitts</p> <p><i>Exploration</i></p> <ul style="list-style-type: none"> 5.1. Space 5.2. Undersea 5.3. Land 	<p style="text-align: center;">Class 10. 03/12 Guest: Student Presentation</p> <p><i>Military Technology</i></p> <ul style="list-style-type: none"> 10.1. Defensive Weapons 10.2. Offensive Weapons 10.3. Smart Weapons 10.4. Unmanned Weapons 10.5. Chemical/Biological 10.6. Nuclear Weapons
<p style="text-align: center;">Final Period 03/19</p> <p><i>Project Presentations</i></p> <p><i>Course Wrapup</i></p>	