Problem 9.2 Engineering Design Ethics Design Brief

Introduction

Ethics is a complex word. When you hear it used, sometimes you are not really sure what it means. The word is often used in several different ways. Ethics is generally defined as the study of morals, which is the study of what is right and wrong or beneficial or harmful to others. In the field of engineering and science, it is a very important concept that is considered in the daily workings of engineers and scientists.

The codes of professional engineers and scientists vary widely within different professional societies. Many professional societies maintain a set of codes, such as the American Institute of Chemists, the American Mathematical Society, the Association of Computer Machinery, and the American Council of Engineering Companies.

These codes of conduct or ethical guidelines are used to govern the practices of the engineers, engineering technicians, scientists, and mathematicians. Sometimes the codes are extensive and may even result in persons losing their advanced degree if they are found to plagiarize work. You may be surprised to learn that there is also a set of codes for student organizations that includes a Hippocratic oath for scientists, engineers, and executives.

This problem is designed to enable you to learn more about engineering design ethics and how ethics should play a role in the work of engineers and scientists.

Equipment

- Computer with Internet access
- Engineering notebook
- Pencil
- Access to library
Procedure

1. With a partner select a category of potential ethical issues.
2. Within that category research a particular case and study the ethical issues encountered. The research does not have to focus on a particular situation, such as stem cell research, but may research the ethics surrounding such an issue.
3. After completing the research create a design brief that will enable another student to research your chosen case study and develop a report of relevant findings. Additionally choose one of the following deliverables to depict your findings:
   a. Design a DVD cover depicting the key findings of the case study.
   b. Design a book cover depicting the key findings of the case study.
   c. Design a poster depicting the key findings of the case study.

Notes:

To save time, the deliverables have been designated on the design brief for you. An example of a completed design brief is also provided to guide you. The example case study may not be used by a team.

The following Internet sites may prove helpful to you in your research:

- Online Ethics Center for Engineering and Science: URL: [http://onlineethics.org](http://onlineethics.org)
- Markkula Center for Applied Ethics: URL: [http://www.scu.edu/ethics/](http://www.scu.edu/ethics/)
- Engineering Ethics: URL: [http://ethics.tamu.edu/](http://ethics.tamu.edu/)

It is critical that you and your partner keep detailed records of your research so that you are able to include the information in the design brief. The research information is critical in that it must be used by the team in order to successfully complete the design brief.

Multiple teams may research the same category; however only one team may research a single topic. NOTE: You and your partner are not permitted to use the sample ethical design brief provided.

The following are the categories within which you and your partner may find an ethical case study to research and then to prepare your design brief.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>SAMPLE ETHICAL TOPICS</th>
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<tbody>
<tr>
<td>Agricultural and Food Biotech</td>
<td>Trench failure</td>
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<tr>
<td>Business Ethics</td>
<td>Anhydrous ammonia hose failure</td>
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<td>Campaign Ethics</td>
<td>Conflict of interest</td>
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<td>Character Education</td>
<td>Whistle blowing</td>
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<td>Cloning and Stem Cell</td>
<td>Cloning or stem cell research</td>
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<td>Research</td>
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<td>End-of-Life</td>
<td>Rights of choice</td>
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<td>Environmental Ethics</td>
<td>Good engineer vs. protecting the environment</td>
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<td>Three Mile Island nuclear disaster</td>
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<td>Ethical Theory</td>
<td>Gift giving or receiving</td>
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<td>Ethics Centers and Institutes</td>
<td>General research regarding different groups and opinions</td>
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<tr>
<td>Foundations</td>
<td>Hyatt Regency walkway collapse</td>
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<td>Global Leadership and Ethics</td>
<td>Encryption and national security</td>
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<td>Government Ethics</td>
<td>The Aberdeen Three and chemical weapons</td>
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<td>Health Care Ethics</td>
<td>Designer medicines</td>
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<td>Legal Ethics</td>
<td>What is plagiarism? What is cheating? Equal justice under the law.</td>
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<td>Media Ethics</td>
<td>TV antenna collapse</td>
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<td>Non-profits</td>
<td>Research ethical issues with groups, such as Greenpeace and CARE</td>
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<td>Public Policy</td>
<td>Ultra-lightweight vehicles</td>
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<td>Religious Perspectives on Ethics</td>
<td>General research regarding different points of view</td>
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<td>Science and Research Ethics</td>
<td>Challenger disaster</td>
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<td>Supranational Organizations</td>
<td>The World Bank or The World Health Organization</td>
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<tr>
<td>Technology and Biotechnology</td>
<td>Biopharma issues</td>
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<td>United Nations Organizations</td>
<td>Research on third-world peasant farmers in cultivating their small plots of land</td>
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<tr>
<td>University-Affiliated Groups</td>
<td>General research regarding different points of view, such as conflict of interest</td>
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</tbody>
</table>
Conclusion

1. What is ethics?

2. What actions are considered cheating?

3. What are your rights and responsibilities as a potential engineer?
Sample: Engineering Ethics Design Brief

Client: Johnson-Susan Company

Designer: Joyce Q. Public

Problem Statement: It has come to the attention of the owners of Johnson-Susan Company, a pharmaceutical company, that they need to educate their employees regarding the proper use of ethics and the code of conduct.

Design Statement: Research the aspects of a case study within the ethical category of Technology and Biotechnology. In particular, review a case study regarding stem cell research and the related ethical issues and codes of conduct. Document all research using proper APA Style citations. Record the ethics or codes that were misused and the results of the case. Design and create either a CD cover, book cover, or poster that depicts the findings of the research.

Constraints:
- Use reputable research sources, in particular those on the Internet ending with either .gov, .edu, or .org.
- Create a Design Brief: three-day research, design, and creation time limit.
- Use ethical practices in the creation of your model.
- Complete the Design Brief: three-day research, design, and create time limit.

Deliverables:
- Initial research citations and documentation
- Engineering notebook
- Choose one:
  - CD cover depicting the key findings of the case study
  - Book cover depicting the key findings of the case study
  - Poster depicting the key findings of the case study
Engineering Ethics Design Brief

Client:

Designer:

Problem Statement:

Design Statement:

Constraints:

Deliverables: Initial research citations and documentation
Engineering notebook
Choose one:

- CD cover depicting the key findings of the case study
- Book cover depicting the key findings of the case study
- Poster depicting the key findings of the case study