

Ethics Across the Curriculum:
A Practical Workshop, Summer 2002
Center for the Study of Ethics in the Professions
Illinois Institute of Technology

**Report on Ethics Integration Projects
Fall 2002 and Spring 2003**

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Introduction

The final assignment for the participants of the “Ethics Across the Curriculum: A Practical Workshop, Summer 2002” was to implement the skills and ideas acquired during the workshop in our courses during the Fall 2002 semester, to evaluate the activities and to report the outcomes.

I had originally planned to incorporate EAC activities in two courses during the Fall 2002 semester, namely, Technology Based Entrepreneurship (ADMI 3125) and Introduction to Java Programming (SICI 4175). However, since I participated in the IIT ethics across the curriculum workshop, I have been appointed special assistant to the UPRM Chancellor. Because of the extra duties of this position, my teaching load has been reduced to one class a semester. I taught ADMI 3125 during the fall semester and SICI 4175 during the spring semester.

While I have integrated the “Ethics Pre-Test” exercise into my classes, I thought I’d form a partnership with Dr. William Frey, and work on another initiative to integrate ethics into the UPRM curriculum. We decided to attempt the Ethics Bowl concept with the students in Dr. Frey’s Engineering Ethics courses. We modified the competition by developing a Spanish language version, by concentrating on cases and issues that arise in the Puerto Rican context, and by trying to integrate the competition into the college and high school levels in Puerto Rico. This is a multi-phase project; the first phase is to develop and refine the competition in UPRM engineering ethics classes. I will discuss other, more ambitious plans later in this report.

During the Spring 2003 semester I also had the opportunity to serve as a judge in the 2003 Intercollegiate Ethics Bowl that is part of the 2003 APPE Conference.

The “Ethics Pre-Test” Exercise

The “Ethics Pre-Test” exercise is a one lecture exercise that I use in my introductory technical classes to introduce the topic of ethics. It has become to be known as a “Pre-Test” because my colleagues also use it as an initial exercise in their ethics courses to help them gauge the students’ awareness of ethics concepts.

Briefly, the exercise consists of the following steps:

(1) I present students with a series of short scenarios (1 to 3 sentences)

The scenarios may be some as simple as the following: “*An employee uses his or her PC at work to send e-mail to friends and relatives.*”

(2) I ask students to informally react to the scenarios (3 questions)

1. Do you think this situation is common/realistic? Yes or No
2. Do you consider this situation Ethical or not? Ethical or Unethical
3. In general, will others disagree with your answer to question #2? Yes or No

(3) I lead an informal discussion as students share their reactions to the scenarios and the questions posed. The discussion will seem chaotic and leading nowhere. After 10 – 20 minutes I bring the discussion to a halt. In my experience students feel helpless and

disappointed at this point because the simple ethical scenarios have generated many issues and I have not provided any formula or systematic way to reach a conclusion. This leads to step 4.

(4) Next, I introduce the “3 Tests”; three questions that help students evaluate the scenarios. The three tests are:

1. REVERSIBILITY: Would I think this is a good choice if I were among those affected by it?
2. PUBLICITY: Would I want this choice published in the newspaper?
3. HARM: Does it do less harm than the alternative?

(Note: These tests are based on handouts from the Ethics in BSE Retreat held in 1998 for faculty of the UPR-Mayagüez Campus. Specifically based on “A Guide for Ethical Decision Making” that is based on models/guidelines by Dr. Vivian Weil and Dr. Michael Davis.)

I mentally keep track of the students’ comments during the informal discussion. Then after describing the tests I point out comments that relate to each of the three tests. In this manner I demonstrate to the students that they are already “thinking ethically” or at least that they have some “wisdom” that perhaps their parents have shared with them that can help them make good decisions that take into account the ethical perspective. At this point students feel much more comfortable, they seem less puzzled.

(5) Having introduced and briefly discussed the tests I ask students re-evaluate the scenarios we have not yet discussed and apply the “3-Tests”. Generally, I have them do this in groups or in pairs for the sake of time. After a few minutes I have them share their views on the scenarios. At this point students use the tests to make better and specific arguments and they are better able to explain their points of view.

(6) Finally, I briefly explain to students the importance of ethics, for example, that it affects our perceptions and that incorporating ethical considerations early in the decision-making process is a wise thing to do. I also, take the opportunity to promote the various ethics courses that are offered at UPRM and share with them sources where they can learn more about ethics (i.e. readings, books, websites, etc.)

I have included a sample of the scenarios I present in one of my classes and the presentation (PowerPoint) I use to guide the lecture. I also include the results of the evaluations utilizing the evaluation form that was provided to the participants of the IIT Summer EAC Workshop.

The results from the feedback of a total of 34 students from both semesters are encouraging. **79%** indicated that the course/module **did** increase their awareness of ethics issues likely to arise in their professions or job. **88%** indicated that the course/module **changed** their understanding of the importance of professional or business ethics. **82%** indicated that the course/modules **increased** their ability to deal with the ethical issues it raised. These results are even more encouraging given the fact that 68% indicated that they had professional or business ethics in previous class.

“Ethics Bowl” at UPR-Mayagüez

The Ethics Bowl has proved a timely way to recast our students’ thinking about ethics. For example, last semester (Fall 2003), the UPR publication, “Dialogo”, canvassed student opinions on requiring ethics courses at the university level. Ethics has come before the public’s attention because of a series of recent government corruption scandals, and one of the responses has been to call for more ethics classes. The students interviewed were almost unanimously against this. But the reasons they offered went beyond requiring university students to take ethics to attacking the very possibility of teaching ethics. According to these students, ethics should not be required because (1) it’s too late by the time students reach college, (2) the preferred method of instruction in ethics classes is indoctrination which violates autonomy, and (3) since ethical relativism is the case, ethics instruction results in those with power (teachers) imposing their views on those without power (students).

The Ethics Bowl offered an effective response by showing students that they could still learn a lot about ethics, that ethics need not be taught by indoctrination, and that ethical arguments succeed, not because of the power of the arguer, but because of the reasonableness of the arguments. In short, the Ethics Bowl offers an effective means of teaching the (ethical) virtue of reasonableness.

We have made some changes in the structure of the debate. First, ours is, as far as we know, the first Spanish Ethics Bowl. Second, we have tightened the time line to carry out the debate in fifty-minute class periods; this has limited somewhat the interaction between the two teams. Third, we have introduced various ways to give students feedback; although students are not graded on the competition (grades are not linked to the judge’s scores since these frequently import different criteria), we fill out a rubric based on the four judging criteria. (We have included this rubric as an appendix.) Taking the feedback they get on the rubric, from the judges, and from the other team, they prepare an in depth written analysis of the case they debated and turn this in at the end of the semester. Besides this rubric, we generate feedback and reflection by having the students prepare a self-evaluation on how they performed in the Ethics Bowl and in the follow-up written case analysis; this self-evaluation is based on goals the students identify at the beginning of the semester when the groups are formed. We are also adding two days of reflection to the competition (one in the middle and one at the end) where students examine their performances, react to the judges, and look for areas of improvement.

The fourth change we have added is to focus the debate on engineering issues, especially those that arise in Puerto Rico. We examined standard engineering ethics issues like safety, conflict of interest, and confidentiality. But we also added cases that explore other issues that arise in Puerto Rico or take on a different form in this context: an electrical engineer signing off on blueprints prepared by a draftsman, a Japanese engineer who refuses to work with a Puerto Rican woman engineer on a cooperative venture, and a case involving the inkjet cartridges manufactured by a local company.

Case selection has proven important. We felt that the cases selected had to be (1) representative of engineering practice in Puerto Rico, (2) comprehensive in terms of the engineering ethics issues covered, and (3) short enough so that student groups would have time to prepare them before the competition but rich enough to allow them to analyze important ethical issues and practice ethical decision making. The following table shows the cases we selected for spring 2003, classified according to the different engineering ethics issues they embody:

Ethics Bowl: Spring 2003 FILO 4045—Professional Ethics in Engineering

Topic/Source of Case	UPRM Ethics Cases	NSPE BER Cases
Confidentiality		Peer Review—Confidentiality Agreements 96-8
Conflict of Interest	Expert Witness, Inkjet Cartridges	Participation in Protest Action as Part of a Political Campaign (BER 84-6), Objectivity of Engineer Retained as Expert (BER 85-4)
Environmental Concerns	Inkjet Cartridges	Public Welfare—Hazardous Waste, 92-6
Product Liability	Pacemaker	Signing of Drawings by Engineer in Industry, 88-5
Safety and Health	Pacemaker	Public Welfare—Hazardous Waste, 92-6
Puerto Rican Women in Engineering	Japanese Engineer	
Engineers as Expert Witnesses	Expert Witness	Objectivity of Engineer Retained as Expert, 85-4
Public criticism by an engineer	Japanese Engineer, Pacemaker	Participation in Protest Action as Part of a Political Campaign, 84-6
Questionable Practices in Engineering in PR	Inserting Change Orders, Expert Witness	
Signing off on documents prepared by others	Blueprints	Use of CADD System, 90-6, Certification of Work Performed by Technician, 91-8
Performing within area of competence	Blueprints	Use of CADD System, 90-6, Certification of Work Performed by Technician, 91-8

Sources: Cases taken from UPRM Ethics Initiatives (NSF SBR-9810253 and UPR Central Administration Grants) and NSPE BER cases taken from Harris, Pritchard & Rabins, *Engineering Ethics: Concepts and Cases* (Book and CD-ROM)

Special effort was made to select cases that would help students prepare for the *Fundamentals in Engineering* exam (we call it the “revalida”) and cases that represented situations that students were likely to encounter once they graduate and begin practicing engineering. Many of the cases come from two UPRM initiatives, a National Science Foundation funded initiative that generated 50 cases in business, science, and engineering, and ABET ethics workshops that generated an additional forty cases in engineering ethics. Through these grants we identified important ethical issues that arise in business, science, and engineering practice in Puerto Rico, and then carried out workshops where representatives from faculty and private industry wrote out these cases. These background efforts contributed to the quality of our Engineering Ethics Bowl.

Each class had its own competition between six teams. Interdisciplinary faculty teams of judges recruited from engineering and humanities rounded out the competitions. One

unexpected benefit of the Ethics Bowl competition was the effect it had on the faculty judges; it helped to acquaint them with the importance of ethics, the ways in which ethics is integrated into engineering practice, and how interesting and engaging ethics debates between students can be. It also serves as an effective way to get faculty involved in ethics across the curriculum efforts. Finally, the judges represented the points of view of the public, client, and practicing engineers, important stakeholders in engineering ethics. Their questions and comments prompted students to respond to issues and perspectives that they had not fully considered before.

Students reacted to the Ethics Bowl with enthusiasm. Half-way through the competition, they responded to a series of evaluation forms designed to assess the success of the Ethics Bowl in promoting team work, working effectively in groups, developing communication skills, and mastering ethical and decision-making frameworks. The following comments give a good idea of their responses:

- *He desarrollado mis destrezas en liderazgo y llegar a acuerdos trabajando en equipo para el Ethics Bowl. Mi experiencia en este tipo de trabajo no siempre ha sido buena, pero esta experiencia ha sido excelente.*
- *Me ha ayudando grandemente a desarrollar mis destrezas en comunicación. Me ha ayudando a tener más confianza en mis habilidades*
- *I had the opportunity to discuss with my group members on several occasions all the cases. We even debated among ourselves when we had different perspectives*
- *We went through the code of ethics several times and by studying possible consequences of what would happen if the codes are violated, we saw the importance of observing the codes at all times.*
- *As a group, all members have to participate both as speakers and writers.*
- *El Ethics Bowl permite el trabajo, asignación de responsabilidades y union de todos para un fin común. Cualidades que se poseen y se refuerzan con este tipo de trabajo.*
- *No somos ingenieros solo para dar resultados calculados ($2 \times 2 = 4$) y ya! Hay impactos, primarias y secundarios; pero todos afectan de una manera positiva, negativa, colectiva y/o individual. Ayudó a considerer todos esos puntos de vista.*
- *[What did you find most helpful about the Ethics Bowl?] To divide the work in groups was good because it is a lot of work for only one person. To have the cases in advance so we can look for information on the cases or about what has happened there. Ex. There were cases on cancer, deforestation, and radiation. To have the exam using the tests before preparing for the ethics bowl because I felt more prepared.*
- *I hated working in groups before this competition. And I also used to do all the work by myself, but I like to work in groups now. My partners were very punctual and responsible. This gave me a different perspective on the way groups work.*

Based on this success, we plan on continuing the Ethics Bowl and even expanding the competition's scope. We have discussed the following possibilities:

- A competition between as well as within sections of Engineering Ethics
- A competition throughout the entire College of Engineering bringing in engineering students who are not taking classes in Engineering Ethics
- A project involving graduate and upper level undergraduate students as coaches for Ethics Bowl teams
- A competition within and between the academic units of UPRM such as (but not limited to) agriculture, arts & sciences, engineering, and business administration.
- Taking a team of UPRM students to compete in the National Ethics Bowl competition
- Promoting an Ethics Bowl competition between the different universities in Puerto Rico
- A course for one credit hour in which Ethics Bowl veterans (students who have competed in the Ethics Bowl) will attend workshops to teach them how to judge competitions. They will research and write up cases for future competitions.

Appendix A: Ethics Bowl Cases

1. Blueprints (UPRM Ethics Case)

You are an electrical engineer and have been practicing as a professional engineer for five now. Your cousin has just completed a one year vocational draftsmanship program and comes to you with a proposal. He will develop blueprints for clients at \$75 a page and bring you the final version for you to sign off on for anywhere from \$200 to \$300 (depending on the complexity). You keep the fee for signing off on the blueprints while he keeps the \$75 per page fee. What should you do?

2. Inkjet Cartridges (UPRM Ethics Case)

An industrial engineering student from a small town has started working in his first job as a member of a research and development team charged with designing a new generation of printers for a market leader in this area. The company he works for wants to maintain its leadership in this area. They also want to respond to the emerging environmental problem caused by the disposal of the inkjet cartridges used in their current model. These inkjet cartridges are made in his hometown. If the new generation of printers does not use disposable cartridges, then the plant in his hometown will close, putting friends and family out of work. His company is a leader in empowering its employees. But what should he do with this newly found power?

3. Inserting Change Orders (UPRM Ethics Case)

You work for a construction company that is bidding for a lucrative contract. You are responsible for submitting the bid. Your supervisor tells you to prepare a bid below the actual cost of the project. When you ask how the company plans to recover its costs, your supervisor tells you to introduce mistakes into the constructions drawings. In this way, the company can recover costs by means of costly change orders. When you express discomfort with this, your supervisor dismisses your concerns. "Everybody does it. If we don't, we will lose the bid and we need this contract." What should you do?

4. Pacemaker (UPRM Ethics Case)

A pacemaker manufacturing company (PACE Inc.) located in a small town in Puerto Rico provides jobs to about 80% of the town's workforce. Profit margins are thin in this competitive field which includes larger U.S. companies. You are on an R&D team for PACE that has studied two options for the circuitry: BULK CMOS and SOI. The team favors BULK CMOS because the manufacturing process is simpler and cheaper. But the chips will be larger and consume more energy; this means more surgery for the patients to replace the batteries. Overall, the use of BULK CMOS would reduce patient life expectancy by 15%. Given this knowledge, what should you do?

5. Expert Witness (UPRM Ethics Case)

An engineer has been hired by a lawyer to serve as an expert witness for his client, an accident victim. The engineer's responsibility is to prepare a formal, technical report that includes (1) a statement of the available facts, (2) the methodology used by the engineer in her investigation, (3) the technical results of that investigation, and (4) the "expert witness opinion" which is based on the results of the scientific investigation. She will offer her services for a flat fee.

She has been hired by a lawyer who is representing the injury victim in court. The lawyer tells her to provide a minimal, incomplete report that leaves out information that will likely be essential to the trial. When it becomes necessary to provide further information the lawyer will bill the client for the additional work done by the engineer. The lawyer puts it this way: "My client has all kinds of money, so we can milk him for additional fees. Then you and I can split the money. Don't worry, everybody does it."

She is uncomfortable with this arrangement, but the attorney is well known, established, and in a position to throw a great deal of work her way. She needs all the work she can get. And the client is loaded. So what should she do?

Case 6: The Japanese Engineer

Your company has recently entered into a cooperative venture with a Japanese firm. A team of engineers from this firm has come to your plant to teach your engineers a new manufacturing process. However, a member of this team, a Japanese engineer with very traditional cultural views, refuses to work with your team because one of the members is a woman. He persists even though you tell him that she is a highly qualified engineer. What should you do?

7. Participation in Protest Action as Part of a Political Campaign (NSPE BER 84-6)

Facts:

Engineer A is a candidate for the state legislature from a district in which there is a substantial percentage of unskilled workers who are represented by a union. In a particular plant where many of these employees work, the third worker in a year was killed recently in an industrial accident. After many discussions between workers and management, the workers set up a picket line to protest what they claim are unsafe working conditions and alleged management indifference to employee safety. During the political campaign Engineer A visits the picket site and participates without having visited the plant to investigate the specific conditions of the previous accident. With TV cameras focused on him, Engineer A holds up a placard which accuses the company of callous disregard for the workers and then joins the protesting employees in the picket line.

Question:

Was it unethical for Engineer A to accuse the company of callous disregard for the workers at the plant?

8. Objectivity of Engineer Retained as Expert (NSPE BER, 85-4)

Facts:

Engineer A is a forensic engineer. He is hired as a consultant by Attorney Z to provide an engineering and safety analysis report and courtroom testimony in support of a plaintiff in a personal injury case. Following Engineer A's review and analysis, Engineer A determines that he cannot provide an engineering and safety analysis report favorable to the plaintiff because the results of the report would have to suggest that the plaintiff and not the defendant was at fault in the case. Engineer A's services are terminated and his fee is paid in full. Thereafter, Attorney X, representing the defendant in the case, learns of the circumstances relating to Engineer A's unwillingness to provide a report in support of Attorney Z's case and seeks to retain Engineer A to provide an independent and separate engineering and safety analysis report. Engineer A agrees to provide the report.

Question:

Was it ethical for Engineer A to agree to provide a separate engineering and safety analysis report?

9. Signing of Drawings by Engineer in Industry (NSPE BER, 88-5)

Facts:

Engineer A is employed by a computer manufacturing company. She was responsible for the design of certain computer equipment several years ago. She signed off on the drawings for the equipment at that time. Although Engineer A's design was properly prepared, the equipment manufacturing process was faulty and, as a result, the equipment became too costly and suffered mechanical breakdown. The manufacturing division made a number of recommended modifications to her design that it believed would help reduce costs in the manufacturing process. Engineer A's analysis of the manufacturing division's recommendations revealed that they would reduce the reliability of the product and greatly increase the downstream costs to the company through warranty claims. Engineer A's supervisor, who is not an engineer, asks Engineer A to sign off on the changes for the new computer equipment. There is nothing to suggest that the equipment would pose a danger to the public health and safety. Engineer A raises her concerns to her supervisor but nevertheless agrees to sign off on the changes without further protest.

Question:

Did Engineer A fulfill her ethical obligation by signing off on the changes without further action?

10. Public Welfare—Hazardous Waste (NSPE BER, 92-6)

FACTS:

Technician A is a field technician employed by an consulting environmental engineering firm. At the direction of his supervisor Engineer B, Technician A samples the contents of drums located on the property of a client. Based on Technician A's past experience, it is

his opinion that analysis of the sample would most likely determine that the drum contents would be classified as hazardous waste. If the material is hazardous waste, Technician A knows that certain steps would legally have to be taken to transport and properly dispose of the drum including notifying the proper federal and state authorities.

Technician A asks his supervisor Engineer B what to do with the samples. Engineer B tells Technician A only to document the existence of the samples. Technician A is then told by Engineer B that since the client does other business with the firm, Engineer B will tell the client where the drums are located but do nothing else. Thereafter, Engineer B informs the client of the presence of drums containing "questionable material" and suggests that they be removed. The client contacts another firm and has the material removed.

QUESTIONS:

1. Was it ethical for Engineer B to merely inform the client of the presence of the drums and suggest that they be removed?
2. Did Engineer B have an ethical obligation to take further action?

11. USE OF CADD SYSTEM (NSPE BER 90-6)

FACTS:

1. Engineer A, a registered professional engineer signs and seals documents he prepared using a CADD system.
2. Engineer B, a registered professional engineer signs and seals documents which are the results of the efforts of others using a CADD system working under Engineer B's direction and control.

QUESTIONS:

1. Was it ethical for Engineer A, a registered professional engineer to sign and seal documents he prepared using a CADD system?
2. Was it ethical for Engineer B, a registered professional engineer, to sign and seal documents which are the work of others using a CADD system, working under his direction and control?

12: Certification of Work Performed by Technician (NSPE, BER Case 91-8)

FACTS:

Engineer A's firm is retained by a major fuel company to perform site investigations in connection with certain requirements under state and federal environmental regulations. Under the procedures established by Engineer A's firm, the site visits will be conducted by engineering technicians under direct supervision of Engineer A who will perform all

observations, sampling, and preliminary report preparation. Engineering technicians will also take photographs of the sites. No professional engineers will be present during the site visits. Following site visits, all pertinent information and material will be presented to Engineer A who is competent in this field. Following a careful review, Engineer A will certify that the evaluations were conducted in accordance with engineering principles.

QUESTION:

Is it ethical for Engineer A to certify that the evaluations were conducted in accordance with engineering principles?

Appendix B: Ethics Bowl Grading Rubric

**Grading Rubric for Ethics Bowl
Professional Ethics in Engineering
Professor William Frey
Fall Semester, 2002**

Criteria/ Degree of Fulfillment	Explanation of Criteria	Needs Improvement	Meets Expectations	Exceeds Expectations	Score/Comments
		20-18	22-20	25-23	
Intelligibility	Has the team stated and defended its position in a way that is logically consistent? Has the team expressed its response with enough clarity and precision that the judge can say he or she reasonably understands it?	1. Logical consistency needs improvement 2. Response could be more clear and/or precise 3. Parts of presentation were not always readily understandable	1. Logically consistency generally maintained 2. Response was reasonably clear and/or precise 3. Presentations were readily understandable.	1. Special and successful efforts were made to show logical consistency (and expose inconsistencies in other team) 2. Response was unusually clear and/or precise 3. Presentation advanced understanding of judges and participants.	
Depth	To what extent does the team's statement and defense of its position indicate an awareness and understanding of the issues that the judge views as ethically central to the case?	1. The ethics and code tests were not (or were minimally) applied 2. Ethics tests were incorrectly applied. 3. Ethics tests were (partially) confused 4. Ethics tests were not integrated into responses.	1. The ethics tests were used to justify and evaluate responses. 2. The ethics tests were correctly applied. 3. The ethics tests were distinguished 4. The ethics tests were integrated into the responses.	1. The ethics tests justified and evaluated the responses in an exemplary way. 2. The ethics tests were applied in a way to illuminate the analysis. 3. The ethics tests were clearly and explicitly distinguished. 4. The ethics tests were constitutive of the responses.	
Focus	To what extent does the team's statement, and	1. The response bore no or little relevance to	1. The response was relevant to the ethical considerations	1. The response was highly relevant.	

Criteria/ Degree of Fulfillment	Explanation of Criteria	Needs Improvement	Meets Expectations	Exceeds Expectations	Score/Comments
		20-18	22-20	25-23	
	defense of, its position avoid discussing issues that the judge considers ethically irrelevant to the case?	<p>the case/issues at hand.</p> <p>2. The response brought in matters that were not relevant to the central ethical issues.</p> <p>3. The response failed to bring out issues that were relevant to the central issue.</p> <p>4. The response was not well-organized and focused.</p>	<p>raised in the case.</p> <p>2. The response did not inject irrelevant matters into the discussion.</p> <p>3. The response touched on all the centrally ethical issues.</p> <p>4. The response was organized and focused.</p>	<p>2. The response raised and illuminated all the centrally ethical issues.</p> <p>3. The response was extremely well-organized and sharply focused.</p>	
Judgment	To what extent, in the judge's opinion, has the team made a careful and reasonable comparative assessment of the considerations it identifies as ethically relevant in its statement and defense of its position?	<p>1. The team failed to take a position.</p> <p>2. The team failed to or offered a minimal justification and defense of its position.</p> <p>3. The team failed to raise central ethical issues in stating its position.</p> <p>4. The team failed to compare its position with other positions.</p> <p>5. The team made a comparative assessment that was not careful and/or reasonable.</p>	<p>1. The team took a position.</p> <p>2. The team offered a careful and reasonable defense of its position.</p> <p>3. The team raised the central ethical issues in stating its position.</p> <p>4. The team comparatively assessed its position.</p> <p>5. The team made a careful and reasonable comparative assessment,</p>	<p>1. The team took a clearly enlightened position.</p> <p>2. The team carefully, reasonably and insightfully defended its position.</p> <p>3. The team raised and illuminated the central ethical issues raised by its position.</p> <p>4. The team's comparative assessment of its position was clearly exemplary in its explanation of alternatives and its demonstration of its own superiority.</p>	

ETHICS BOWL MODULE EVALUATION FORM

Directions: You have just completed an exercise designed to show how ethics is a part of and can be integrated into the activity of engineering. We would like your input on how effective you found this exercise. Assess these different topics using the following scale:

- 1 Strongly Disagree
- 2 Disagree
- 3 Neither agree nor disagree
- 4 Agree
- 5 Strongly Agree

ETHICS INTEGRATION MODULE	1	2	3	4	5
I found the cases used in this semester's Ethics Bowl interesting.					
The cases used in this semester's Ethics Bowl are representative of situations that occur in the real world.					
These cases made me more aware of the ethical issues that arise in engineering.					
This exercise gave me an opportunity to practice the four ethics tests presented in class. (Reversibility, harm, publicity, and code)					
This exercise helped me to learn better these four tests.					
It was helpful to prepare the summaries of the 12 cases assigned for the Ethics Bowl with my Ethics Bowl team.					
We discussed the case summaries in our Ethics Bowl team either in class, outside of class, or both.					
I learned about engineering ethics by discussing the Ethics Bowl cases with my team.					
Through the Ethics Bowl, I learned more about the engineer's responsibilities to the public.					
Through the Ethics Bowl, I learned more about the engineer's responsibilities to the client.					
Overall, I think this was a good exercise.					

1. What did you find most helpful about the Ethics Bowl? Explain

2. What did you find least helpful about the Ethics Bowl? Explain

3. What topic/skills were you able to learn in the Ethics Bowl?

4. What topics were left out that should have been covered?

5. What would you have liked to have said during this class but were unable to say for some reason such as time?

Ethics Bowl Assessment Form
Professional Ethics in Engineering
Professor William J. Frey
Fall Semester 2002

Answer the following questions:

1. Has preparing the Ethics Bowl helped you to develop the ability to function on multidisciplinary teams? Yes No

2. If you answered “No,” how could it be changed to help in this matter? If you answered “Yes,” how did the Ethics Bowl help?

3. Did the Ethics Bowl help you to develop your ability to identify, formulate and solve engineering ethics problems? Yes No

4. If you answered “No,” how could it be modified to help? If you answered “Yes,” how did it help?

5. Did the Ethics Bowl better your understanding of professional and ethical responsibility? Yes No

6. If you answered “No,” how could it be modified to help? If you answered “Yes,” how did it help?

7. Did the Ethics Bowl help you to develop your ability to communicate? Yes No

8. If you answered “No,” how could it be modified to help? If you answered, “Yes,” how did it help you?