

Lecture 4: Ethical Dilemmas and Moral Reasoning

ENG101 Engineering Professionalism

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Ethical Dilemmas

- ☐ Situations in which moral reasoning comes into conflict
- ☐ Application of moral values are unclear
- ☐ Decision is not obvious
- ☐ Routine moral decision making in engineering also requires weighing and balancing conflicting moral values
- ☐ Need for professional code of ethics

<https://www.engineeringpassion.com/ethical-dilemmas-in-engineering-and-examples/>



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Ethical Dilemmas

- ☐ Engineers must put engineering ethics ahead of all engineering factors when making engineering decisions.
- ☐ Development of new technologies, engineering processes and products may or may not involve decisions
- ☐ Responsibility to serve the public
- ☐ Disclosure of engineering decisions and why they were made

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Ethical Dilemmas

An Ethical Analysis of the Coal Industry

Will Elon Musk's Starlink satellites harm astronomy? Here's what we know.

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Resolving Ethical Dilemmas

☐ Moral clarity

- *Identify the values at stake: obligations or moral minimums, duties, rights, goods, ideals, or other moral considerations*
- *Refer to moral framework and code of ethics*
- *Talking to colleagues*

☐ Conceptual Clarity

- *Precision in using the key concepts (ideas) applicable in the situation*
- *The larger picture: Why a particular part of the code of ethics has been developed?*
- *Take directions or consider the overall good of the organization and the society?*

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Resolving Ethical Dilemmas

☐ Information about the facts

- *Obtain relevant information*
- *Consider options and alternatives*

☐ Information about the options

- *Obtain relevant information*
- *Consider options and alternatives*

☐ Reasoning

- *Make a reasonable decision*
- *Deliberation based on reasons, facts and values*
- *Codes are not recipe books*

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A Case Study

A chemical engineer working in the environmental division of a computer manufacturing firm learns that the company might be discharging unlawful amounts of lead and arsenic into the city sewer. The city processes the sludge into a fertilizer used by local farmers. To ensure the safety of both the discharge and the fertilizer, the city imposes restrictive laws on the discharge of lead and arsenic. Preliminary investigations convince the engineer that the company should implement stronger pollution controls, but their supervisor tells them the cost of doing so is prohibitive and that technically the company is in compliance with the law. The engineer is also scheduled to appear before town officials to testify in the matter. What should they do?

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A Case Study (Moral clarity)

Like most codes of ethics, the code of ethics of the American Institute of Chemical Engineers (AIChE) indicates the engineer has at least three responsibilities in the situation. One responsibility is to be honest: "Issue statements or present information only in an objective and truthful manner." A second responsibility is to the employer: "Act in professional matters for each employer or client as faithful agents or trustees, avoiding conflicts of interest and never breaching confidentiality." A third responsibility is to the public, and also to protect the environment: "Hold paramount the safety, health and welfare of the public and protect the environment in performance of their professional duties." In the case at hand, the members of the public most directly affected are the local farmers, but the dangerous chemicals could affect more persons as lead and arsenic are drawn into the food chain. Additional moral considerations, not cited in the code, include duties to maintain personal and professional integrity, and rights to pursue one's career.

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A Case Study (Conceptual clarity)

What does it mean to “hold paramount the safety, health and welfare of the public” in the case at hand? Does it pertain to all threats to public health, or just serious threats, and what is a “serious” threat? Again, does being “objective and truthful” simply mean never lying (intentionally stating a falsehood), or does it mean revealing all pertinent facts (withholding nothing important) and doing so in a way that gives no preference to the interests of one’s employer over the needs of the public to be informed of hazards?

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A case study (Informed about the facts)

the chemical engineer needs to check and recheck her findings, perhaps asking colleagues for their perspectives. Her corporation might be violating the law, but is it actually doing so? We, like the engineer, need to know more about the possible harm caused by the minute quantities of lead and arsenic over time. How serious is it, and how likely to cause harm?

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A case study (Informed about the options)

The chemical engineer might be able to suggest a new course of research that will improve the removal of lead and arsenic. Or they might discover that the city's laws are needlessly restrictive and should be slightly revised. Perhaps they can think of a way to convince their supervisor to be more openminded about the situation, especially given the possible damage to the corporation's image if it should later be found in violation of the law. Unless an emergency develops, these and other steps should be attempted before informing authorities outside the corporation—a desperate last resort, especially given the likely penalties for whistleblowing.

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A Case Study (Well reasoned)

The code does assert one very important hierarchy: Hold paramount the public safety, health, and welfare. Nevertheless, sometimes it is quite challenging to clearly determine what "the public" means in specific cases. Does the public include future generations? If so, how much value should we assign to them?³ The AIChE code also requires engineers to "formally advise their employers or clients (and consider further disclosure, if warranted) if they perceive that a consequence of their duties will adversely affect the present or future health or safety of their colleagues or the public." This statement, combined with the statement of the paramount responsibility, makes it clear that the responsibility to be a faithful agent of the employer does not override professional judgment in important matters of public safety.

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At the same time, the recommendation to “consider further disclosure, if warranted” seems somewhat lukewarm, both because it is placed parenthetically and because it only says “consider.” It suggests something to think about, rather than a firm statement of duty. As such, it is weaker than statements in the NSPE and other codes that require notification of appropriate authorities when one’s judgment is overridden in matters where public safety is endangered. Which of these codes takes precedence?

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Furthermore, exactly what does the paramount statement entail in the case at hand? If the engineer is convinced the company produces valuable computers, might they reasonably conclude that the public good is held paramount by coming “close enough” to obeying the law? As for the requirement to be “objective and truthful,” that certainly implies not lying to the town officials, but might the engineer reasonably conclude they are being objective by not divulging information their supervisor says is confidential? Obviously, such conclusions might be products of rationalization (biased reasoning), rather than sound moral reasoning. We mention them only to suggest that codes are no substitute for morally good judgment—honest, fair, responsible moral judgment. Indeed, as we have just seen, good judgment is needed even in interpreting the code of ethics. The development of good moral judgment is part and parcel of developing experience in engineering. It is also a primary goal in studying ethics.

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References

1. Zhu, Q., Martin, M. W., & Schinzinger, R. (2022). *Ethics in engineering*.