Lecture Notes

Professionalism & Corporate Ethics (303193304)

Ethics in Engineering: Resolving ethical dilemmas

1. Content:

- This lecture focuses on methods for resolving ethical dilemmas faced by engineers. We will discuss decision-making frameworks, real-world applications, and interactive classroom activities to deepen understanding.

2. Learning Objectives:

By the end of this lesson, students should be able to:

- Define ethical dilemmas in engineering contexts.
- Identify common frameworks for ethical decision-making.
- Apply strategies to resolve ethical challenges in engineering practice.
- Analyze real-life cases of ethical dilemmas and their resolutions.

3. Introduction

Ethical dilemmas arise when engineers face conflicting responsibilities, such as balancing corporate goals with public safety. Resolving these dilemmas requires critical thinking, ethical reasoning, and adherence to professional standards.

4. Key Concepts/Definitions

- **Ethical Dilemma:** A situation where choices conflict between moral values or professional responsibilities.
- **Utilitarianism:** Ethical theory focused on maximizing overall happiness.
- **Deontological Ethics:** Ethics based on duty and rules.
- **Virtue Ethics:** Ethical approach emphasizing moral character.
- **Conflict of Interest:** Situation where personal gain compromises professional judgment.
- **Whistleblowing:** Reporting unethical practices within an organization.

5. Detailed Explanation (with examples)

A. Understanding Ethical Dilemmas in Engineering

1. **Causes of Ethical Dilemmas**
    - Conflicting interests (company vs. public safety).
    - Financial constraints vs. quality assurance.
    - Environmental sustainability vs. cost-effectiveness.

Lecture Notes

Professionalism & Corporate Ethics (303193304)

2. **Common Ethical Decision-Making Frameworks**
    - **Consequentialist Approach:** Weighing outcomes to determine the best choice.
    - **Deontological Approach:** Following ethical duties and principles.
    - **Virtue-Based Approach:** Acting in a way that aligns with moral virtues.

B. Examples of Ethical Dilemmas

1. **Safety vs. Profit:** Engineers pressured to approve designs despite safety concerns.
2. **Environmental Impact:** Balancing economic efficiency with eco-friendly designs.
3. **Whistleblowing:** Reporting a faulty engineering decision that could harm consumers.

6. Diagrams/Tables:

Ethical Decision-Making Approaches	Description
Utilitarianism	Focus on overall consequences and maximizing good.
Deontology	Adherence to rules and duties regardless of outcomes.
Virtue Ethics	Emphasizes moral character and integrity.

7. Real-Life Applications/Case Examples:

- **The Challenger Disaster (1986):** Engineers raised concerns about faulty O-rings but were pressured to approve the launch, leading to a catastrophic failure.
- **Volkswagen Emissions Scandal:** Ethical misconduct in software manipulation to bypass emission standards.

8. Tips, Tricks, or Mnemonics:

*** Mnemonic for Ethical Decision-Making:** "**S.T.E.P.S.**"

S – Stop and analyze the problem.
T – Think about consequences.
E – Evaluate ethical principles.
P – Pick the best ethical action.
S – Sustain integrity and follow through.

9. Classroom Activity/Interaction

1. **Scenario-Based Discussion:** Divide students into groups and provide different ethical scenarios. Ask them to apply a decision-making framework and present their resolutions.

Lecture Notes

Professionalism & Corporate Ethics (303193304)

10. Summary/Key Takeaways:

- Engineers frequently encounter ethical dilemmas requiring structured resolution.
- Ethical decision-making frameworks aid engineers in navigating conflicting choices.
- Real-world cases illustrate the importance of integrity in engineering.
- Engineers must uphold professional responsibility while considering broader societal impacts.

11. References/Resources:

- National Society of Professional Engineers (NSPE) Code of Ethics
- Martin & Schinzinger, "Ethics in Engineering"
- Case studies from IEEE Ethics Centre